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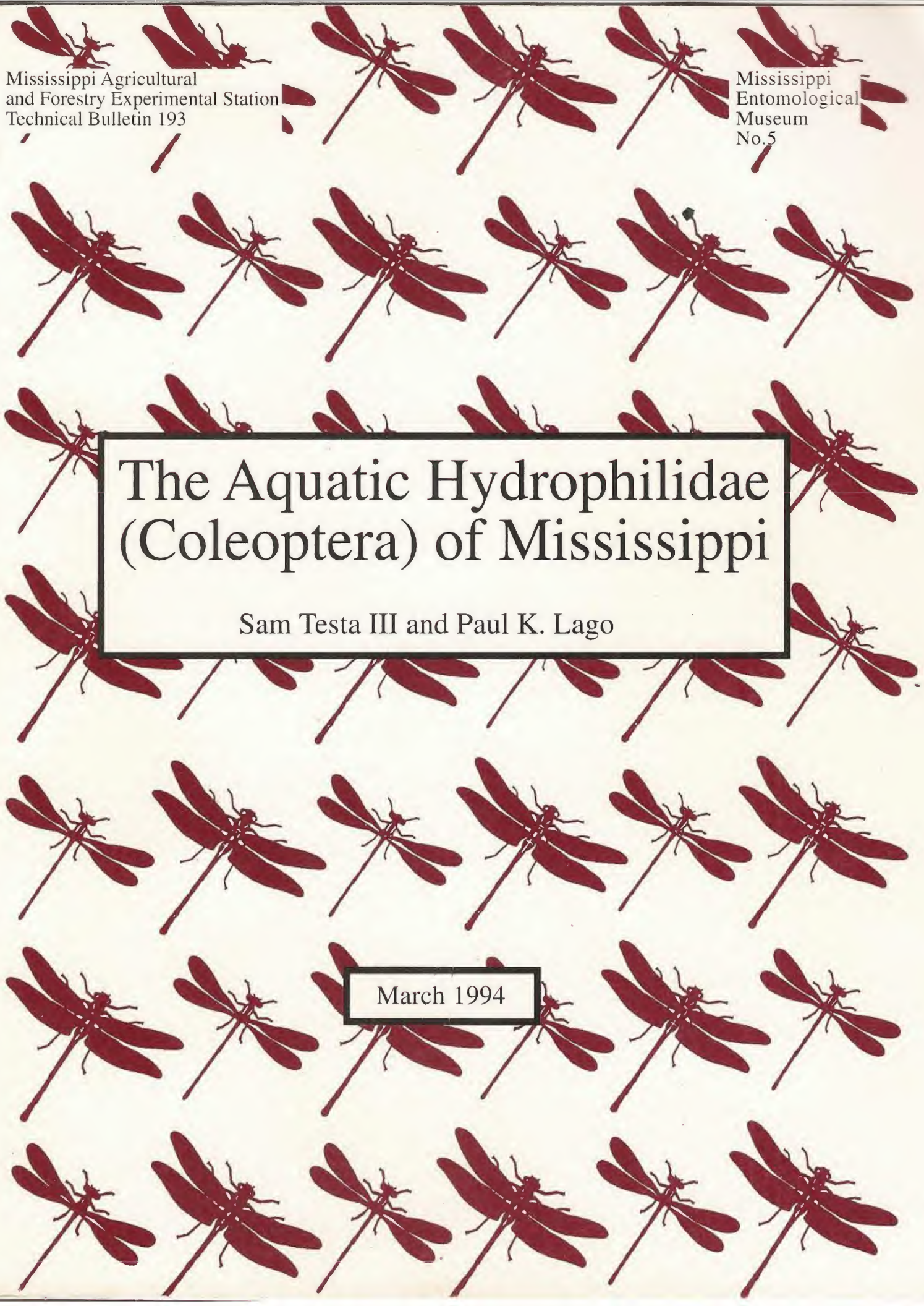

The Aquatic Hydrophilidae (Coleoptera) of Mississippi

Sam Testa III and Paul K. Lago

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Abstract

A general survey of the aquatic Hydrophilidae of Mississippi was conducted from January 1986 through March 1993. This study was based on collections that were made in all 82 counties in the state and on material in university and private collections. Approximately 10,100 specimens of adults of Hydrophilidae were examined. Fifty-five species in 21 genera were found to occur in Mississippi; 29 species represent new state records. Based on published distributional data, six additional species probably occur in the state, and these are included in the subsequent discussions.

Keys for identification of subfamilies, genera, and species of adults of aquatic Hydrophilidae occurring or likely to occur in Mississippi are presented, along with illustrations of representative species of each genus and diagnostic characters useful for distinguishing each taxon. A diagnosis, notes on taxonomy, relative abundance, habitats, and collecting techniques, and comments on state and regional distribution are provided for each species.

The Aquatic Hydrophilidae (Coleoptera) of Mississippi

Introduction

Much emphasis is being placed upon the effects of man's actions on the environment. Interest in these effects is apparent in the work of government agencies and conservation organizations, and in public demonstrations, television specials, and even plays and books, where environmental perturbations are the focus. Concern about pest or economically important species has been evident for many years, but the fact that man also is causing the extirpation of many nonpest species of animals and plants from large areas now has become known. This loss of biota is due not only to pollution, the most publicized topic, but also to water and land development and misuse. Lists of threatened and endangered species are growing quickly for many states and for the nation as a whole, and studies of "nongame" species are receiving increasing support.

In this study, we examined the aquatic Hydrophilidae (Coleoptera) of Mississippi, produced keys for the identification of the species encountered, and gathered information about habits and distribution of each species. Although faunistic reports on the Hydrophilidae of other eastern states have been published (Blatchley, 1910; Brigham, 1982; Malcolm, 1971; Matta, 1974; Wooldridge, 1967; Young, 1954), the present work is enhanced by recent generic revisions delimiting new species found in or near Mississippi (e.g., Wooldridge, 1966; Miller, 1974; Gundersen, 1978; Smetana, 1974, 1978, 1980, 1985). These enable more complete coverage and keys for identification than are currently available in any other regional study.

The family Hydrophilidae is one of the most diverse groups of aquatic beetles. Although several families of beetles inhabit aquatic environments, hydrophilids are exceeded in diversity only by dytiscids (Dytiscidae), which they sometimes closely resemble. Usually black and convex and ranging in size from less than 2 mm to greater than 40 mm, Hydrophilidae are among the primary colonizers of newly formed aquatic habitats (Wilson, 1923a). Individuals of many species can be collected consistently from areas of emergent vegetation and areas where organic debris has accumulated. Hydrophilids are found most commonly in standing water habitats, ranging from lake and pond margins to puddles in roadside ditches. Some species inhabit lotic environments where they usually are found in areas protected from strong currents. Unique aquatic habitats in any area often contain equally unique faunas.

The common name, water scavenger beetles, is not completely representative of the Hydrophilidae. One subfamily, the Sphaeridiinae, is predominantly terrestrial, living as larvae and adults in dung or other moist organic material. Adults of *Cymbiodyta* are found commonly in wet leaf litter and other moist situations. Also, adults of some aquatic species are omnivorous, feeding on living plants, especially algae, and decaying organic materials (Balduf, 1935). A few species occasionally prey on small fish (Wilson, 1923b). The larvae of most aquatic species do not scavenge, but they are voracious predators and are often cannibalistic.

Life histories among the aquatic Hydrophilidae vary little among genera. Eggs are deposited into a silken case that varies structurally from a loose submerged pouch to a floating purse with a mast or sail. Larvae usually have three instars of variable duration, during which time they often remain in very shallow water. When fully mature, larvae leave the water to construct subterranean pupation chambers at varying distances from the water. In extensive shallow waters, the pupal chamber may be constructed in a windrow of debris (Brigham, 1982), and in one instance during the present study, pupae were found beneath the exposed loose bark of a partially submerged log. After pupation, adults typically remain in the chamber until fully melanized and sclerotized before emerging and returning to the water. More than one generation per year is possible for most Hydrophilidae, depending on the duration of the individual species' development and the duration of the warm season.

Generally, adults are the overwintering stage. Richmond (1920) reported finding adults of several species shallowly buried in the banks of ponds at moderate distances from the water during winter. Other overwintering adults have been found in lakeshore debris (Leng and Mutchler, 1918), forest litter, and rotten logs (present study). Aestivation has been reported for members of the genus *Helophorus* (Engelke, 1980).

Richmond (1920) and Wilson (1923a, 1923b) detailed the life histories of members of several hydrophilid genera. Other accounts of the biologies of immature hydrophilids were provided by Balduf (1935), Cheary (1971; *Laccobius*), Leech and Chandler (1956), Rengel (1901; *Hydrophilus*), Riley (1881; *Hydrophilus*), Archangelsky and Durand (1992a, 1992b; *Dibolocelus, Phaenonotum*), Spangler (1961; *Sperchopsis*), Van Tassel (1966; *Berosus*), and Young (1958; *Tropisternus*). The most recent keys to larvae and pupae were given by Brigham (1982) and Leech and Chandler (1956), respectively. Spangler (1973) provided a key to the larvae of the genera of the subfamily Hydrophilinae.

All adults of aquatic hydrophilids, as far as known, rise to the surface to breathe, replenishing their supply of air located on the ventral surface of the thorax and under the elytra. In most species, the beetle positions itself parallel to the water surface. The antennae are used to break the surface tension and connect the storage area with the atmosphere via an air

"funnel." Air exchange then is facilitated by a pumping motion of the elytra and abdomen (Wilson, 1923a).

Adults of the various subfamilies of the Hydrophilidae show differing degrees of adaptation to life in the water. The Berosinae and Hydrophilinae are adapted well to the aquatic environment and possess swimming ability. The Hydrobiinae and Helophorinae can swim but are slow and awkward. The habits of the Chaetarthriinae are not known well, but they appear semiaquatic, living in tunnels in wet sand or soil at the water's edge and only occasionally venturing into the water (Miller, 1974). The Sphaeridiinae are predominantly terrestrial, living in dung or other moist organic material, and only the genus *Phaenonotum* commonly occurs in aquatic habitats (Smetana, 1978).

Most North American Hydrophilidae are not economically important, although some Palearctic species are pests of crops (Smetana, 1985). Wilson (1923a, 1923b), in addition to describing the biology of several Hydrophilidae, discussed the relationship of the beetles to other aquatic inhabitants, and he considered larvae of larger species to possibly be important as predators in fish ponds. Adult and larvae of Hydrophilidae are dietary items of many animals, including fish, amphibians, reptiles, aquatic birds, and, during flight periods of the adults, other birds and bats. Adults of hydrophilids often leave the water at night in dispersal flights, and these may be attracted to lights in large numbers.

There are approximately 2,000 described species of Hydrophilidae, with 233 in 32 genera occurring in America north of Mexico (Smetana, 1988, Brigham, 1982). The Hydrochidae, sometimes considered a subfamily of the Hydrophilidae and including the genus *Hydrochus* Leach, is not considered in this study. Arnett (1968) reviewed the taxonomic status of the genera occurring in the United States. Since then, several taxonomic revisions of the family have been published. Citations of these taxonomic works are found within the appropriate generic discussions that follow. Knisch (1924) provided the last world catalog for the Hydrophilidae, and more recently, Arnett (1983) compiled a checklist of North American species.

Mississippi records of 27 species of aquatic Hydrophilidae are scattered in the literature. *Sperchopsis tessellata* (Ziegler) was recorded from several Mississippi localities by Spangler (1961). Richmond (1962, 1968) reported 18 species of aquatic hydrophilids in his publications on the fauna and flora of Horn Island, Mississippi. In 1974, Miller recorded *Chaetarthria pallida* (LeConte) from Horn Island, probably in reference to Richmond's specimen(s). Smetana (1974) reported *Cymbiodyta chamberlaini* Smetana and *C. vindicata* Fall from Mississippi and later noted *Phaenonotum exstriatum* (Say) from the state (Smetana, 1978). Wooldridge (1978) described *Paracymus seclusus* from a series of specimens collected in Harrison County, Mississippi. The genus *Enochrus* was revised by Gundersen (1978), who examined specimens of *E. ochraceus* (Melsheimer), *E. sublongus* (Fall), *E. cinctus* (Say), *E. perplexus* (LeConte), *E. pygmaeus pygmaeus* (Fabricius), *E. pygmaeus nebulosus* (Say), and *E. hamiltoni* (Horn) from the state. Finally, *Hydrochara spangleri* Smetana was reported from Mississippi by Smetana (1980).

Collecting Techniques

Water scavenger beetles can be collected in a variety of ways. A D-frame aquatic net used along the margin of various aquatic habitats often provides many specimens, especially if vegetation or debris is present. Most netting is done by standing on the shore and dragging the net along the bottom directly to shore while using a quick bumping motion to dislodge specimens from submerged substrates. Repeated dips of the net in the same area capture specimens that were dislodged but not captured during the first sweep. Examination of the surface of this disturbed water often reveals small beetles that became trapped in the surface film. Generally, a mass of organic matter and mud or sand will be trapped in the net. Rinsing the sample in deeper, clear water will remove fine, particulate matter, leaving debris containing the aquatic insects. Sorting can be done in a white enamel pan or on any other available hard surface. Lack of water seems to elicit an escape behavior, and beetles leave the mass of debris where they are easily seen against the pan and can be captured with forceps or the fingertips. As numbers of escaping individuals decrease, the entire mass can be turned over to expose beetles hiding or trapped below. The mass can then be separated with the fingers or forceps and examined for any remaining beetles, such as the slow-crawling *Helophorus*. The specimens are placed with a label into 70% isopropyl or ethyl alcohol for temporary storage.

As previously mentioned, hydrophilids leave the water and take flight during the warm months, often en masse. Usually, this occurs soon after dusk. During this time, most species are attracted to light, and blacklight traps often yield many specimens. Large numbers of Hydrophilidae have been collected near store or street lights, particularly mercury vapor lights.

The light-trapping apparatus used during this study consisted of a battery-powered, 15-watt blacklight placed over a white enamel pan containing isopropyl alcohol. This apparatus usually was placed at water's edge just before dusk and allowed to remain for at least one hour. Individuals attracted to the light, but remaining in the water, can be collected with an aquarium net. Many specimens may be found on the ground surrounding the pan, and this area should be searched routinely before leaving a site. The pan can be floated in an aquatic habitat, particularly where tall vegetation covers shore lines.

A white sheet can be suspended as a background, and the blacklight hung in front of the sheet facing the aquatic habitat to be sampled. The sheet should be draped so that its bottom covers the ground below the light, allowing better visibility of specimens. By necessity, this type of trap is placed further from the water's edge. It provides better "drawing" power due to the sheet's reflective properties. An enamel pan containing alcohol can be placed on the sheet beneath the

light. Many beetles fall into the pan after striking the sheet, and specimens crawling on the sheet are collected easily.

The use of a flashlight to search in shallow water after dark can be very rewarding. This method can yield many specimens and more specific habitat data but is certainly more labor intensive than netting or light-trapping.

Another valuable technique involves disturbing the substrate and submerged vegetation in shallow water, thus dislodging beetles crawling on the plant material. This is accomplished with the feet and commonly is called "treading." Smaller, nonswimming hydrophilids (especially *Paracymus* and *Crenitulus*) float to the surface and are trapped in the surface film. They will "crawl" along the surface film until contacting partially emergent plant material or the shore, where they are able to resubmerge. While at the surface, they can be captured easily.

Specialized methods are helpful for collecting *Laccobius* and *Chaetarthria*. Members of the genus *Laccobius* occur in shallowly submerged sand of slow-moving creeks, and the beetles can be exposed by gently brushing the top layer of sand with the flattened hand. Exposed individuals will propel themselves along the bottom, often to the land-water interface, and burrow into the sand again. Specimens can be collected with the fingers or a dip net before they return to the sand. Specimens of *Chaetarthria* live in small tunnels in wet sand above the waterline, and they can be detected by pushing sand into the water. The beetles are captured as they float at the surface. *Chaetarthria* may also be collected with light traps, but they apparently fly only very short distances, necessitating placement of the trap directly upon sandbars near the water.

Study Area

Mississippi is located almost totally within the East Gulf Coastal Plain physiographic region of North America. The state encompasses a total area of 48,434 square miles, including 46,914 square miles of land surface and 1,520 square miles of water surface. Of this area, state and federally managed areas encompass more than 2,000,000 acres (Roger Jones, The Mississippi Nature Conservancy, personal communication). Topography of the state is characterized generally by rolling hills, and varies in elevation from sea level in the south to 806 feet above sea level in the extreme northeast. The northeastern corner of the state, a part of the Cumberland Plateau, provides Mississippi's greatest variance in topography.

Mississippi includes 11 recognizable physiographic regions (Figure 1). To the extreme south, Mississippi borders the Gulf of Mexico. Present here is a series of islands, which represent the Barrier Islands physiographic region of the state, composed primarily of typical coastal dunes habitat. The coastal counties of Hancock, Harrison, and Jackson encompass the Lower Coastal Plain region within the conterminous southern extreme of the state, whereas their northern portions fall into the larger Pine Hills region. The Lower Coastal Plain region historically contained large areas of savannah, but control of wildfire has resulted in increased forestation. The Pine Hills region is characterized, as inferred from its name, by expanses of pine-dominated forests on hilly lands. The Jackson Prairie and Black Belt Prairie were dominated by inland grasslands, but intervention by man has resulted in increased forestation and agricultural use of the land. The Loess Hills, running from north to south, form a natural barrier to historical flooding of the Mississippi River that inundated the Alluvial Plain (Mississippi-Yazoo Delta) region, which it parallels. These hills are forested primarily by hardwood tree species. The Alluvial Plain now has been isolated from the river by a network of levees, and its bottomland-hardwood forests, numerous swampy bayous, and oxbow lakes have declined in quantity and quality through conversion to agriculture and subjection to agricultural runoff. The North-Central Plateau and Flatwoods regions are dominated by hardwood forests, with moderate agricultural use. Due to their greater range

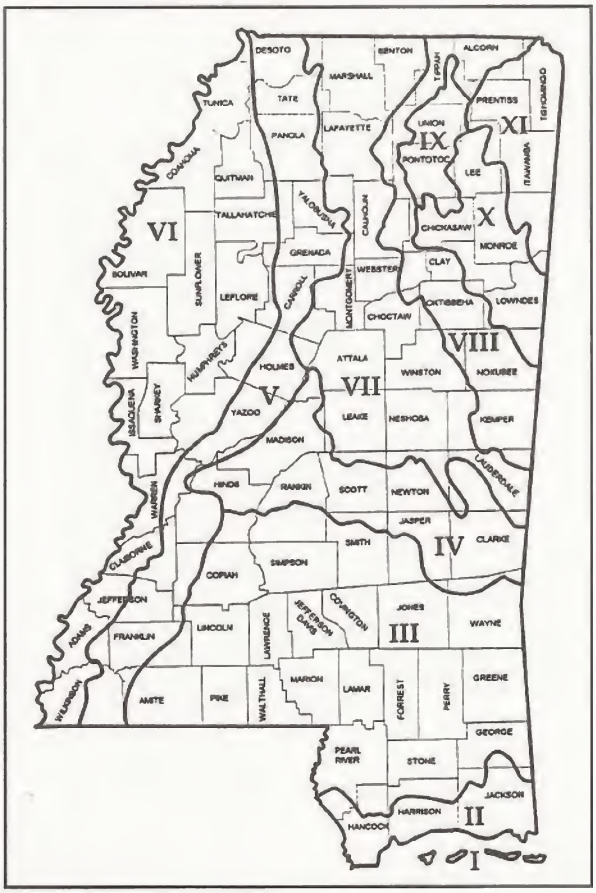


Figure 1. Mississippi counties and physiographic regions: I = Barrier Islands, II = Lower Coastal Plains, III = Pine Hills, IV = Jackson Prairie, V = Loess Hills, VI = Alluvial Plain, VII = North-Central Plateau, VIII = Flatwoods, IX = Pontotoc Ridge, X = Black Belt Prairie, XI = Tombigbee-Tennessee River Hills.

of elevations and geologic formations, the Pontotoc Ridge and Tombigbee-Tennessee River Hills regions in the northeastern counties of Tippah, Alcorn, Prentiss, Itawamba, and Tishomingo, form an important geographic region to be considered when conducting a faunal or floral study of the state. The various physiographic regions of the state are discussed more completely in Lowe (1919) or Cross et al. (1974).

The mean annual temperature for the state is approximately 65° F, ranging from an average of 62° in the northeast to 68° in the southwest. The mean annual precipitation is about 54 inches, averaging 50 inches in the northwestern corner to 64 inches in the extreme south (McWhorter, 1962). Monthly averages in precipitation vary from a low of 2.4 inches in October to a high of 6.2 inches in March (U.S. Geological Survey, 1985).

Aquatic habitats abound in Mississippi, consisting of thousands of acres of natural wetlands, various types of impoundments, and streams and rivers, including the Mississippi River, which discharges roughly 620,000 cubic feet of water per second into the Gulf of Mexico. Lakes and reservoirs exceeding 40 acres in size cover 358 square miles of Mississippi, with a multitude of smaller ponds occurring throughout the state. These waters have a mean monthly high surface-water temperature of 80-85° F during July and August (Geraghty et al., 1973). The six major reservoirs used for flood control in the state each have more than 25,000 acre-feet (8,150 million gallons) of storage (U.S. Geological Survey, 1986), but they are subject to considerable water level fluctuation.

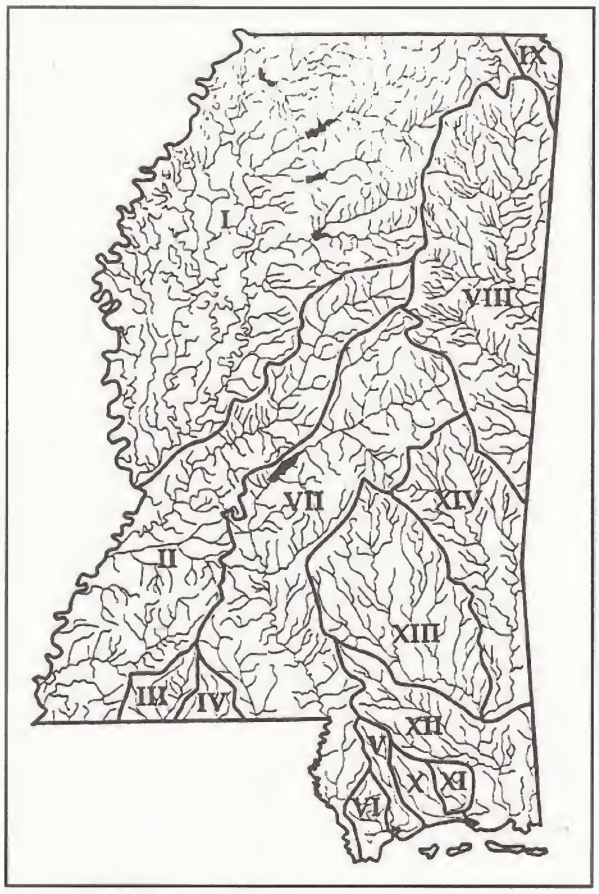


Figure 2. Mississippi stream systems (modified from Cook, 1959): I = Upper Mississippi, II = Lower Mississippi, III = Amite River, IV = Tangipahoa River, V = Wolf River, VI = Jordan River, VII = P earl River, VIII = Tombigbee River, IX = Tennessee River, X = Biloxi River, XI = Tchoutacabouffa River, XII = Pascagoula River, XIII = Leaf River, XIV = Chickasawhay River.

Small streams and rivers densely overlay the state with a network of flowing waters (Figure 2). In the northern and central regions of the state, these streams are characterized generally by bottoms of coarse sand and clear waters, occasionally flowing through gravel beds. These streams normally meander and are fairly shallow, but many have been channelized and/or subjected to runoff from agricultural or community drainage systems. The deeper, channelized streams with steep banks and very little emergent vegetation often carry very high loads of sediment during periods of rainfall. Streams of southern Mississippi typically have bottoms of finer sand, and their waters often are darkened with leachates from leaves and other allochthonous inputs, creating "blackwater." A majority of these southern streams remain fairly natural and contain pool, riffle, and snag habitats.

Most ponds and lakes within Mississippi are man-made and are used for flood control, agriculture, and/or recreation. The USDA Soil Conservation Service (SCS) has engineered 1,584 watershed lakes in Mississippi. For those having precise data available, 532 lakes have a total surface area of 17,703 acres and an average size of 33 acres (Ferguson and Dillard, 1989). Most of the remaining SCS watershed lakes are probably smaller than this size, and many are likely under 10 acres in area. Combined with the flood control reservoirs, these manmade lakes account for most of the truly lentic areas in the state; however, a large number of natural oxbow lakes and wetland areas do occur. In north and central Mississippi, these habitats remain fairly open, with vegetation only around the margins. In southern Mississippi, however, ponds in open areas often become choked with aquatic vegetation such as waterlily (*Nymphaea, Nuphar, Nelumbo*), alligator weed (*Alternanthera*), and water hyacinth (*Eichhornia*). Natural, persistent woodland ponds are not common.

Specimens examined

Approximately 10,100 specimens of Hydrophilidae from Mississippi are recorded in the following discussions. These represent holdings in various collections throughout the state, but this number in no way approximates the actual number of individuals encountered during our field work. For instance, 103 specimens of *Hydrophilus triangularis* are reported here; however, on one evening in June, 1991, nearly 1,000 individuals of this species were counted on a tennis court com-

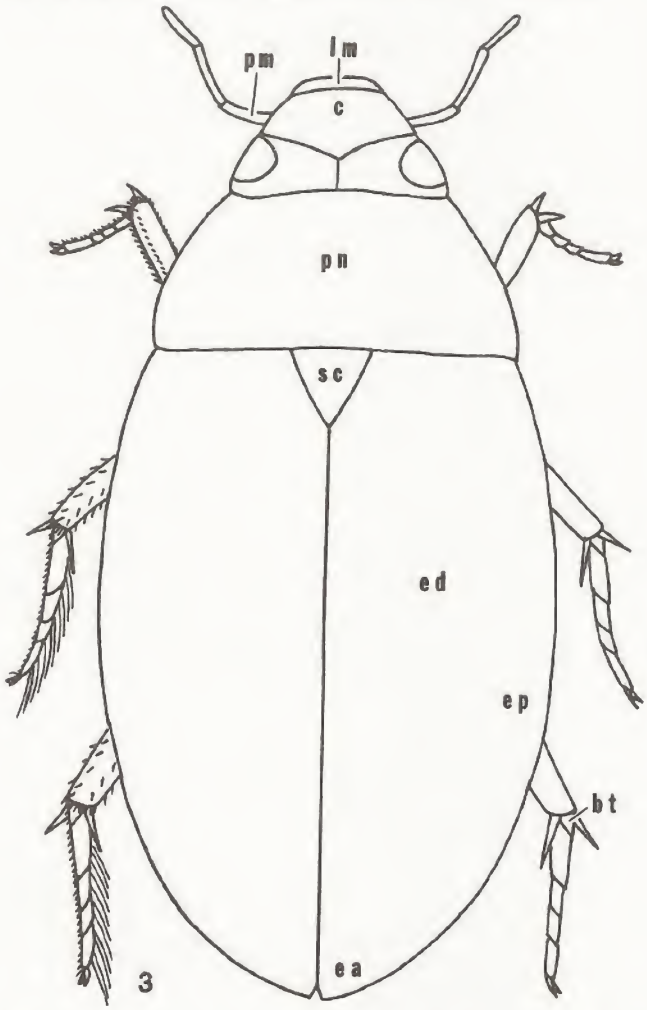
plex in Oxford (Lafayette County). Similar examples could be given for many species of *Tropisternus, Berosus, Enochrus* and others, which often were captured in nets or flew to blacklight traps in prodigious numbers. On these occasions, representative samples were collected. In addition to specimens we collected, material housed at the University of Mississippi, the Mississippi Entomological Museum (Mississippi State, Mississippi), Mississippi College (Clinton, Mississippi), the Mississippi Museum of Natural Science (Jackson, Mississippi) and in the private collections of M.O. Mann, B. Mather, and A.E. Zuccaro, Jr. was examined.

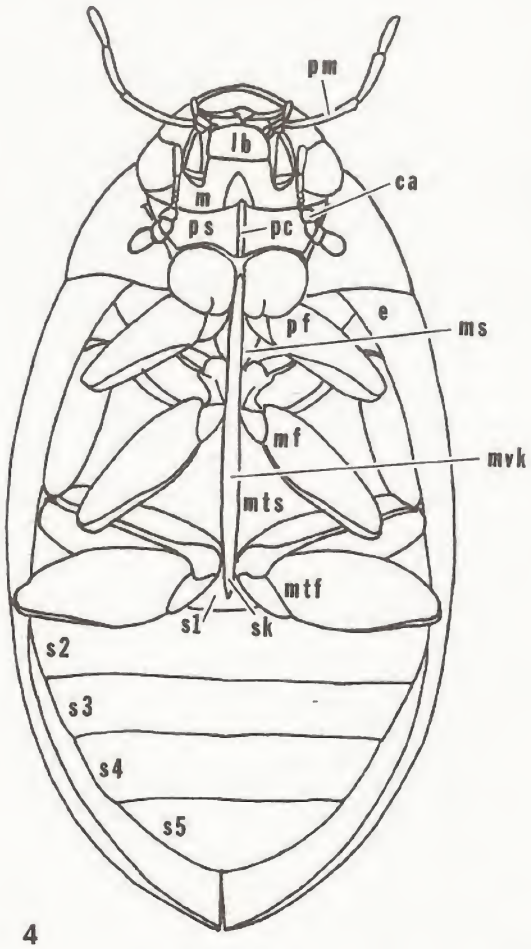
Diagnostic Techniques

General morphology of hydrophilid beetles is similar to that of other Coleoptera. Figures 3 and 4 illustrate most of the characters mentioned in this text. More detailed illustrations of difficult characters used in keys are provided in other figures. The sexes in species of most genera of aquatic Hydrophilidae can be separated without dissecting genitalia as males have protarsi that are expanded and modified into attachment pads or have protarsal claws that are recurved greatly (both modifications usually used during copulation).

The shape of the male genitalia is used often for positive identification of species of several hydrophilid genera. Genitalia of fresh or relaxed specimens were extracted with fine-tipped forceps inserted into the tip of the abdomen. A tiny hook formed on the end of a minuten pin, embedded in a small wooden handle, was used to withdraw genitalia of smaller specimens.

The genitalia of male Hydrophilidae typically are composed of two lateral lobes or parameres, a median lobe, and a basal





Figures 3 - 4. Anatomical characters of *Hydrochara soror*. bt = basal tarsomere, c = clypeus, ca = cupule of antenna, e = epipleuron, ea = apical area of elytron, ed = discal area of elytron, ep = plectral area of elytron, lb = labium, lm = labrum, m = mentum, mf = mesofemur, ms = mesosternum, mts = metasternum, mvk = metasternal portion of ventral keel, pf = profemur, pm = pseudobasal segment of maxillary palpus, pn = pronotum, pc = prosternal carina, ps = prosternum, s = sternite, sc = scutellum, sk = spine of metasternal keel; 3, dorsal view; 4, ventral view.

piece, all of which are sclerotized but joined by membrane. Most male genitalia retain their shape when dry and can be left attached to the body or removed and glued to a paper point. Those of teneral specimens should be removed from the body and placed into a drop of glycerine inside a microvial that is attached then to the pin supporting the specimen. The female genitalia of Hydrophilidae are membranous and similar among closely related species. They appear to be of little use in species identification. Where possible, exclusive use of the genitalic characters in the keys has been avoided.

In some instances, the genitalia must be examined on dried specimens. The insect can be placed into very warm (not boiling) water for 2-3 minutes. This usually softens the tissues adequately to permit removal of genitalia and also cleans the specimen's exterior surface. Specimens can be softened and cleaned in dilute ammonium hydroxide or with Barber's solution. Smetana (1988) described an alternative method of removal and preservation of genitalia from relaxed specimens. He suggested placing the relaxed specimen in a drop of distilled water and, by using two fine pins with hooked ends, separating the elytra and removing the posterior abdominal segments containing the genitalia. The genitalia then can be pushed through the posterior end of the abdomen, and removed by severing the connecting membrane. While allowing the separated genitalia to soak in isopropyl alcohol, the body of the specimen can be returned to its natural shape and remounted. The genitalia then can be mounted, along with the se vered abdominal segments, directly into Canada balsam on a transparent plate that can be attached to the pin with the specimen body.

Checklist of the Aquatic Hydrophilidae of Mississippi

* New state record.
[V] Probably occurs in Mississippi.

CHAETARTHRIINAE
- *Chaetarthria* Stephens
  - *atra* (LeConte)[V]
  - *pallida* (LeConte)

HELOPHORINAE
- *Helophorus* Fabricius
  - *linearis* LeConte*
  - *marginicollis* Smetana*

HYDROPHILINAE
- *Hydrophilus* Müller
  - *triangularis* Say*
- *Dibolocelus* Bedel
  - *ovatus* (Gemminger and Harold)*
- *Tropisternus* Solier
  - *blatchleyi* d'Orchymont
  - *collaris* (Fabricius)
  - *lateralis nimbatus* (Say)
  - *natator* d'Orchymont*
  - *quadristriatus* (Horn)
- *Hydrobiomorpha* Blackburn
  - *casta* (Say)
- *Hydrochara* Berthold
  - *brevipalpus* Smetana*
  - *occulta* (d'Orchymont)[V]
  - *soror* Smetana*
  - *spangleri* Smetana

SPHAERIDIINAE
- *Phaenonotum* Sharp
  - *exstriatum* (Say)
  - *minor* Smetana[V]

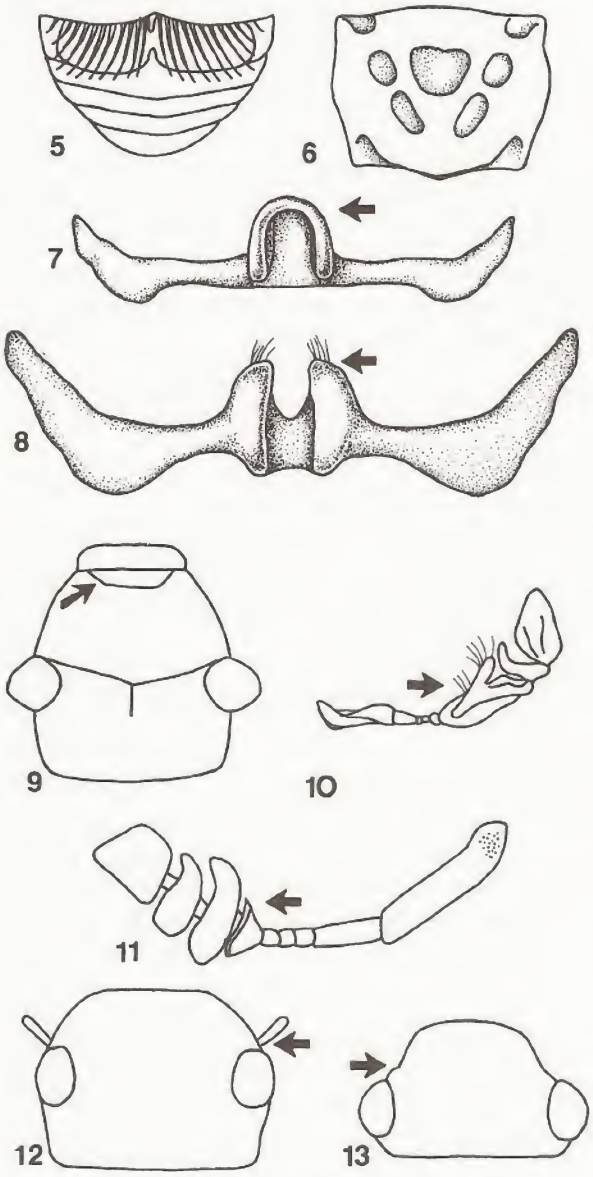
BEROSINAE
- *Berosus* Leach
  - *aculeatus* LeConte*
  - *corrini* Wooldridge*
  - *exiguus* (Say)
  - *infuscatus* LeConte
  - *ordinatus* LeConte*
  - *pantherinus* LeConte*
  - *peregrinus* (Herbst)*
  - *pugnax* LeConte*
  - *striatus* (Say)*
- *Derallus* Sharp
  - *altus* (LeConte)*

HYDROBIINAE
- *Laccobius* Erichson
  - *magnus* Cheary[V]
  - *minutoides* d'Orchymont*
  - *teneralis* Cheary*
- *Sperchopsis* LeConte
  - *tessellata* (Ziegler)
- *Hydrobius* Leach
  - *tumidus* LeConte*
- *Crenitulus* Winters
  - *suturalis* (LeConte)*
- *Anacaena* Thomson
  - *limbata* (Fabricius)
- *Paracymus* Thomson
  - *confusus* Wooldridge*
  - *lodingi* (Fall)*
  - *nanus* (Fall)
  - *reductus* (Fall)*
  - *seclusus* Wooldridge
  - *subcupreus* (Say)
- *Enochrus* Thomson
  - *blatchleyi* (Fall)*
  - *cinctus* (Say)
  - *consors* (LeConte)
  - *consortus* Green
  - *hamiltoni* (Horn)
  - *interruptus* Gundersen*
  - *ochraceus* (Melsheimer)
  - *perplexus* (LeConte)
  - *pygmaeus* (Fabricius)
  - *reflexipennis* (Zimmermann)*

sayi Gundersen*
sublongus (Fall)
Helochares Mulsant
maculicollis Mulsant*
Helobata Bergroth
striata (Brullé)
Helocombus Horn
bifidus (LeConte)*
Cymbiodyta Bedel
chamberlaini Smetana
minima Notman[V]
semistriata (Zimmermann)*
toddi Spangler[V]
vindicata Fall

Key to Subfamilies and Genera of Aquatic Hydrophilidae of Mississippi

1. Ventral surface of first two abdominal sternites with common excavation filled with a bilobate, gelatinous mass held in place by stout, posteriorly projecting cilia (Figure 5); length less than 3 mm (Chaetarthriinae) ..... *Chaetarthria*
   Ventral surface of abdomen not as above; length variable 2
2. Pronotum with seven longitudinal grooves (Figure 16); pronotum widest in anterior half (Helophorinae) ..... *Helophorus*
   Pronotum without longitudinal grooves; pronotal width variable 3
3. Pronotum with a pattern of "dents" (Figure 6), posterior margin distinctly narrower than base of elytra; eyes highly protuberant, head not deflexed; only three or fewer antennomeres precede cupule ..... Family Hydrochidae (not included)
   Without above combination of characters; pronotum without pattern of dents, posterior margin occasionally narrower than base of the elytra; eyes occasionally protuberant, but if so, head usually deflexed; usually four or more antennomeres preceding cupule 4
4. Meso- and metasternum produced into elevated median keel projecting as a spine posteriorly beyond hind coxae (Hydrophilinae) 5
   Meso- and metasternum without a keel produced into spine posteriorly 9
5. Length greater than 30 mm 6
   Length less than 20 mm 7
6. Prosternum sulcate posteromedially, sulcus hooded (closed) anteriorly, receiving anterior edge of mesosternal keel (Figure 7). ..... *Hydrophilus*
   Prosternal sulcus not hooded anteriorly, allowing anterior edge of mesosternal keel to contact head (Figure 8) ..... *Dibolocelus*
7. Prosternum tectiform (roof-like), raised along midline; metasternal spine not reaching hind margin of first abdominal sternite; length usually greater than 13 mm 8



Figures 5 - 13. Characters for identifying genera. 5, ventral surface of abdomen of *Chaetarthria pallida*; 6, pronotum of *Hydrochus* species; 7 - 8, prosternum, 7, *Hydrophilus triangularis*, arrow = closed "hood" of process, 8, *Dibolocelus ovatus*, arrow = open process; 9, clypeus and labrum of *Hydrobiomorpha casta*, arrow = emargination of clypeus; 10 - 11, antennae, 10, *Hydrobiomorpha casta*, arrow = highly asymmetrical seventh segment, 11, *Hydrochara soror*, arrow = roughly symmetrical seventh segment; 12 - 13, head, dorsal view, 12, *Phaenonotum exstriatum*, arrow = smooth margin of head, 13, *Sphaeridium* species, arrow = angulate margin of head.

Prosternum sulcate medially to receive anterior edge of mesosternal keel; metasternal spine reaching hind margin of first abdominal sternite; length usually less than 13 mm ..... *Tropisternus*

8. Clypeus broadly emarginate anteriorly, exposing articulation of labrum (Figure 9); prosternal process with long, posteriorly projecting spine; sixth (cupule) and seventh antennomeres highly asymmetrical, seventh deeply grooved, V-shaped and bilobed (Figure 10). ..... *Hydrobiomorpha*

Clypeus nearly truncate anteriorly; prosternum with at most a small tooth at its posterior apex; sixth and seventh antennomeres only slightly asymmetrical (Figure 11) ..... *Hydrochara*

9. First tarsomere of hind (and middle) leg longer than second segment; second segment of maxillary palpus distinctly thicker than third or fourth (Sphaeridiinae) 10

First tarsomere of hind (and middle) leg shorter than second segment (first segment sometimes minute and best seen with transmitted light) or tarsi four-segmented; second segment of maxillary palpus similar in width to third and fourth 11

10. Head not abruptly constricted anterior to eyes, lateral margin concealing bases of antennae when viewed dorsally (Figure 12); elytra with all striae (including sutural striae) absent, surface confusedly punctate throughout ..... *Phaenonotum*

Head abruptly constricted anterior to eyes, exposing bases of antennae in angles created when viewed dorsally (Figure 13); or, head not constricted as above and sutural striae present ..... Terrestrial Sphaeridiinae

11. Middle and hind tibia fringed on inner face with long setae (often adhered to tibia and tarsi and not readily discernible); elytra striate, pale, generally with dark spots (Figure 29); head normally strongly deflexed; body very convex; pronotum widest near middle, and not continuous in outline with elytra; elytral margins never serrate; length less than 8.0 mm (Berosinae) 12

Middle and hind tibia not fringed with long setae (present on tarsi of *Laccobius*); elytra occasionally striate, but never in specimens less than 3 mm in length; head not normally deflexed; body shape variable; lateral margins of pronotum generally continuous in outline with elytra, pronotum usually widest at base; elytral margins serrate or smooth; length variable (Hydrobiinae) 13

12. Elytra yellowish to reddish-brown with pattern of dark spots; eyes protuberant; length variable. ... *Berosus*

Elytra black; eyes not protuberant; length less than 3 mm ..... *Derallus*

13. Elytra without impressed discal or sutural striae; yellow with distinct dark speckles; trochanters of hind leg more than one-third length of femur; pronotum with central indistinct reddish-brown pattern; length less than 3 mm ..... *Laccobius*

Elytra with at least sutural striae; normally black to reddish-brown; hind trochanters less than one-third length of femur; pronotum occasionally patterned; length variable 14

14. Maxillary palpus with last segment as long or longer than penultimate; palpi usually short and stout, approximately as long as antennae 15

Maxillary palpus with ultimate segment usually shorter than penultimate; palpi long and slender, distinctly longer than antennae 19

15. Elytral disc striate or serially punctate; length greater than 4 mm 16

Elytral disc nonstriate (sutural striae may be present), confusedly punctate; length less than 4 mm 17

16. Clypeus sharply and distinctly emarginate apically; lateral margins of elytra weakly serrate; head not continuous in outline with pronotum (Figure 48); color reddish-brown ..... *Sperchopsis*

Clypeus nearly truncate; lateral margins of elytra smooth; head continuous in outline with pronotum; color normally black ..... *Hydrobius*

17. Hind tarsi longer than tibiae; elytra setose (very difficult to detect); form narrowed posteriorly from near elytral humeri in dorsal view; dorsum nonmetallic ..... *Crenitulus*

Hind tarsi shorter than or subequal in length to tibiae; elytra bare; form evenly convex in dorsal view; dorsum often with metallic sheen 18

18. Prosternum longitudinally carinate; hind femora sparsely setose or bare basally; dorsum piceous and usually with metallic sheen ..... *Paracymus*

Prosternum noncarinate; hind femora densely pubescent; dorsum dark brown to black, never metallic ..... *Anacaena*

19. All tarsi five-segmented, although basal segment may be very small (best observed with transmitted light) 20

Middle and hind tarsi four-segmented 22

20. Lateral margins of clypeus, thorax, and elytra distinctly extended laterally; clypeus meeting thorax laterally and with eyes not forming part of margin; body form very flattened, limpet-like ..... *Helobata*

Lateral margins of clypeus, thorax, and elytra at most slightly extended laterally clypeus not meeting thorax laterally and with eyes forming part of margin; body form convex 21

21. Pseudo-basal segment of maxillary palpus (when extended forward) convex mesally (Figure 64); mesosternum with mesal, projecting longitudinal crest ..... *Enochrus*

Pseudo-basal segment of maxillary palpus (when extended forward) concave mesally (Figure 79); mesosternum lacking mesal, projecting longitudinal crest, at most slightly raised ..... *Helochares*

22. Elytra distinctly striate; maxillary palpi very long, penul-

timate segment about as long as width of labrum at front of clypeus; mesosternum with short, conical projection medially ..... *Helocombus*

Elytra at most serially punctate; maxillary palpi shorter, penultimate segment about two-thirds length of labrum at front of clypeus; mesosternum with transverse ridge that may be elevated medially into tooth or pyramidal projection ..... *Cymbiodyta*

Subfamily Chaetarthriinae

Genus *Chaetarthria* Stephens

Chaetarthria Stephens, 1833. The nomenclature of British insects...2nd ed.: 22.

Diagnosis. Length: 1.5-3.0 mm. The small size and the bilobate gelatinous mass held in the basal abdominal sterna by stout bristles easily distinguish this genus. They closely resemble some members of the terrestrial subfamily Sphaeridiinae, none of which carry a gelatinous mass. Males of the species in Mississippi can be recognized by their modified protibiae, having one margin expanded in an "elbow-like" angle and having raised, oblong "plates" on the medial surface, which may be analogous to modi fied protarsi of other hydrophilid genera. In females, the protibiae have both sides nearly equally divergent from base to apex and lack the plates on the medial surface.

Notes. Miller (1974) revised this genus for the Nearctic region and recognized 32 species. Similarity of form in these beetles has created a challenge to identification, as indicated by the fact that only 15 Nearctic species were recognized prior to Miller's work.

These beetles occur in tunnels in wet sand that lacks mud or silt, usually at the margins of streams or rivers. Apparently, they usually remain in the tunnels at night. None of the North American species have been reported to enter the water.

Miller (1974) reported that individuals can be collected by pushing sand into the water and capturing the beetles as they float at the surface but that populations were difficult to locate. In addition, he reported that individuals were attracted to light traps.

The habitat requirements of these beetles may explain their apparent scarcity in Mississippi. Channelization of waterways, leading to narrower wetted margins and more silt and clay in the substrate, has made many areas unsuitable for *Chaetarthria*, which prefer clean sand.

The gelatinous mass at the base of the abdomen was considered to have an egg-carrying function by Richmond (1920). However, Miller (1974) concluded this was erroneous, based on rearing studies and the fact that both sexes possess the mass. The function remains unknown.

Key to Species of *Chaetarthria* in Mississippi

1. Elytra ranging from light brown to deep reddish-black; medial surface of male protibiae with eleven, narrow, slanted plates ..... *C. atra* (LeConte)

   Elytra testaceous; inner surface of male protibiae with three, broad, slanted plates...*C. pallida* (LeConte)

Chaetarthria atra (LeConte)

Cyllidium atrum LeConte, 1863. Smithsonian Misc. Coll. 6(167): 24.

Diagnosis. Length 2.0-2.5 mm. This is the only species of *Chaetarthria* with dark elytra occurring in the eastern United States. Also, the 11 flat plates on the male protibiae are distinctive.

Distribution. *Chaetarthria atra* occurs throughout the eastern United States, except states bordering the Gulf of Mexico (Miller, 1974). Although no records are known from Mississippi, the species is known to occur as far south as central Tennessee and northern Arkansas. This species eventually may be found in the higher elevations of northeastern Mississippi.

Chaetarthria pallida (LeConte)

Figures 5, 14, 15; Map 1

Cyllidium pallidum LeConte, 1861. Proc. Acad. Natur. Sci. Philadelphia 13: 342.

Diagnosis. Length 1.5-2.0 mm. In addition to being the only species of *Chaetarthria* with testaceous elytra known to occur in the eastern United States, this species differs from most others, including *C. atra*, by having three, partially raised plates on the medial surface of the protibiae (Figure 14).

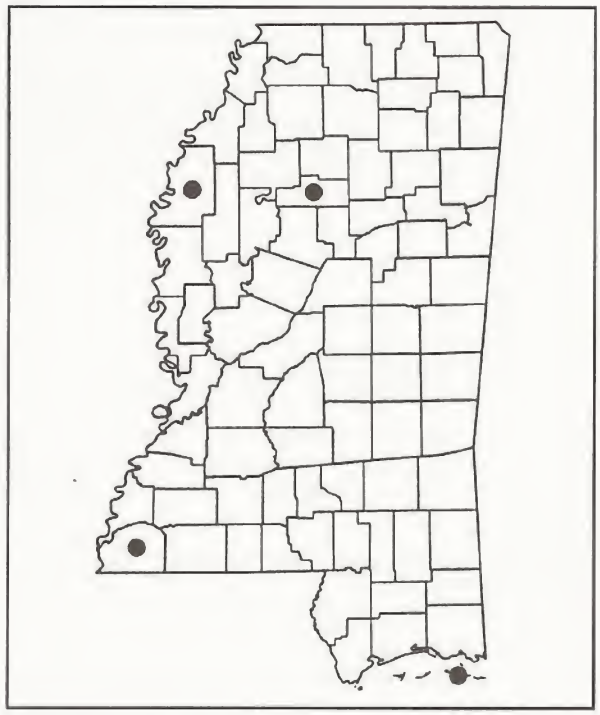
Notes. Miller (1974) recognized three forms within this species, differing in shape of the male genitalia, microsculpture of the dorsal body surface, and size, but these forms were not treated further. Genitalia of specimens collected from central Mississippi do not match exactly any of those figured by Miller for *C. pallida*. Either the species is exceedingly variable or several closely related species are included under this name.

Specimens from inland localities in Mississippi were collected at blacklight traps placed on sandbars. Richmond (1962) collected a large series from Horn Island, Mississippi, indicating the species is tolerant of brackish conditions. Leng and Mutchler (1918) reported a specimen from shore debris along a lake in Florida during December, suggesting a possible overwintering site for this species.

Distribution. As now defined, *C. pallida* occurs throughout much of the United States and northern Mexico (Miller, 1974). Mississippi records are from widely scattered localities (Map 1).

Specimens examined: 39 (Appendix 1).

Figure 14. Protibia of *Chaetarthria pallida*, medial surface, arrow = "plate."



Map 1. *Chaetarthria pallida*.

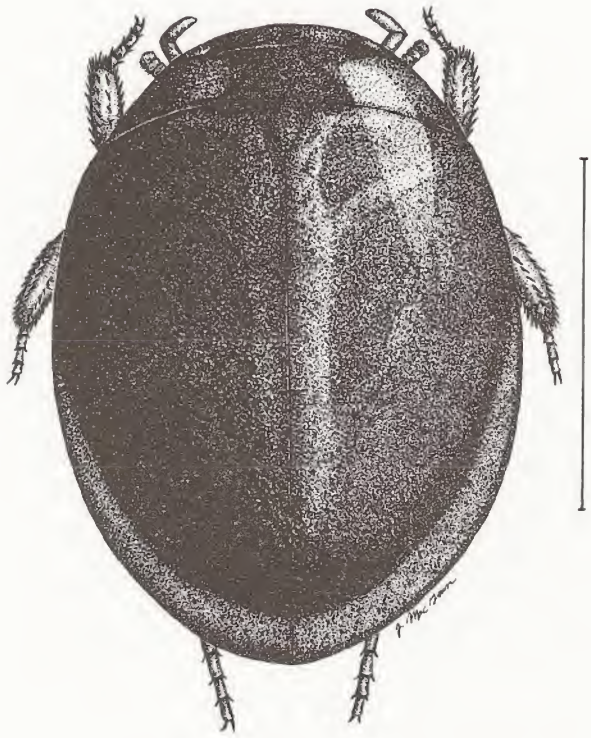


Figure 15. *Chaetarthria pallida*, scale line = 1 mm.

Subfamily Helophorinae

Genus *Helophorus* Fabricius

Helophorus Fabricius, 1775. Systema Entomologiae. . . Flensburgi et Lipsiae: 66.

Diagnosis. The presence of seven, longitudinal pronotal grooves differentiates members of this genus from all other hydrophilids occurring in the United States. The elytra are distinctly punctate-striate. *Helophorus* are quite similar in form to the Hydrochidae, which lack pronotal grooves. There are apparently no secondary sexual characteristics in the genus.

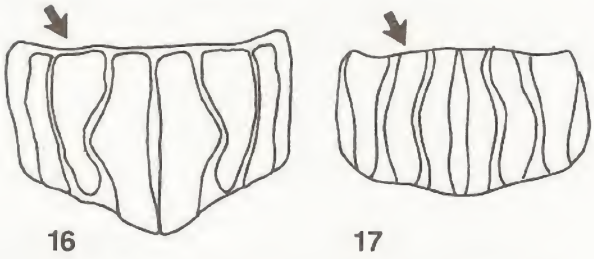
Notes. This genus recently was revised for the Nearctic region by Smetana (1985), who recognized 41 species. The original generic name *Elophorus* was emended incorrectly by Illiger (1801) to *Helophorus*. Because of the widespread and lengthy use of the emended name, Smetana (1985) supported its continued usage with Fabricius as the author. Angus (1992) petitioned the International Commission on Zoological Nomenclature to uphold *Helophorus* as the accepted spelling.

Helophorus are collected often from the shallows at margins of standing waters where thick-stemmed vegetation occurs or organic debris has accumulated. They also have been noted to inhabit very wet environments near the land-water interface, including sand, mud, and debris, and they have been collected from various mosses (Smetana, 1985)

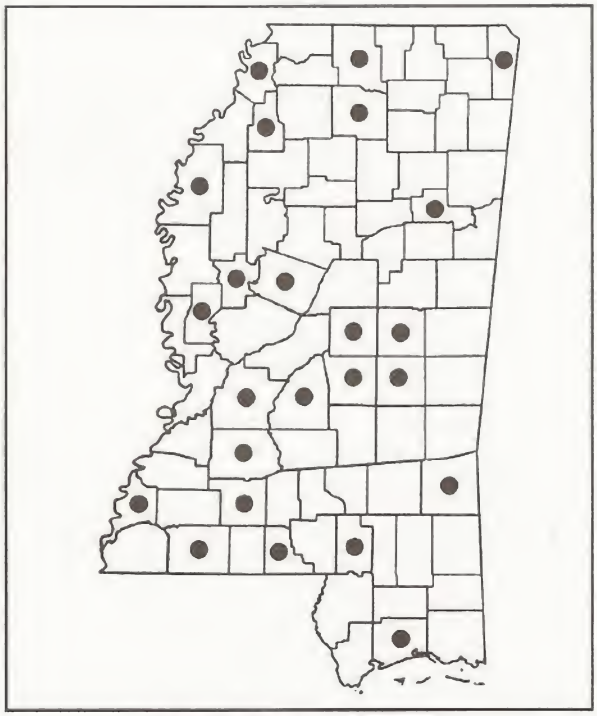
Key to Species of *Helophorus* in Mississippi

1. Pronotum with posterior half of second and fifth (submedial) raised areas about one-half as wide as anterior half (Figures 16 and 18), with distinct granulose tubercules on all raised areas; epicranial suture very slightly, if at all, widened at stem before fork, stem margined with distinct, granulose tubercles . . . . . *H. marginicollis* Smetana

   Pronotum with second and fifth raised areas of pronotum, at most, only slightly narrower in posterior half (Figure 17), with or without distinct granular tubercles on raised areas; epicranial suture noticeably widened anteriorly, stem never margined with distinct tubercles . . . . . *H. linearis* LeConte



Figures 16 - 17. Pronotum of *Helophorus* species, arrows = submedial raised area. 16, *Helophorus marginicollis;* 17, *Helophorus linearis*.



Map 2. *Helophorus linearis*.

Helophorus linearis LeConte
Figure 17, Map 2

Helophorus linearis LeConte, 1855. Proc. Acad. Natur. Sci. Philadelphia 7: 357-358.

Diagnosis. Length 2.6-3.8 mm. *Helophorus linearis* can be differentiated from *H. marginicollis* by the shape of the submedial pronotal raised areas (Figure 17), as well as other characters mentioned in the key.

Notes. Most specimens were collected from emergent vegetation, ranging from grass to *Ludwigia*, in shallow, usually lentic water.

Distribution. This species occurs throughout the eastern United States except in Florida and adjacent states (Smetana, 1985); it has been collected throughout Mississippi except in Gulf coastal counties (Map 2).

Specimens examined: 126 (Appendix 2).

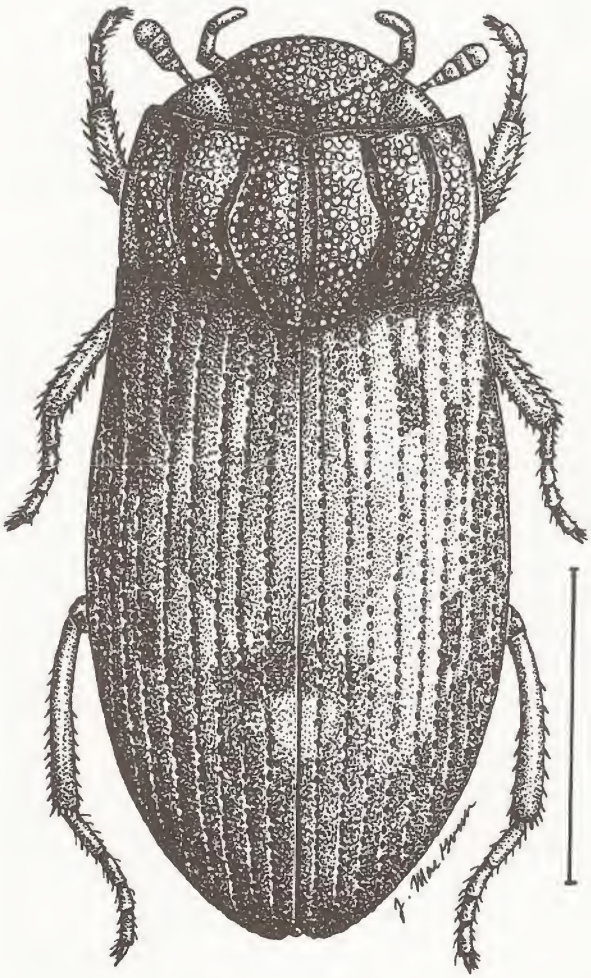


Figure 18. *Helophorus marginicollis*, scale line = 1 mm.

Helophorus marginicollis Smetana
Figures 16, 18, Map 3

Helophorus marginicollis Smetana, 1985. Mem. Entomol. Soc. Canada 131: 106.

Diagnosis. Length 1.8-3.8 mm. The distinctive shape of the submedial raised areas on the pronotum (Figure 18) and the granulose-tuberculate margin of the epicranial suture readily distinguish this species. The head, pronotum, and elytra are distinctly tuberculate, and specimens usually have a strong cupreus reflection dorsally.

Notes. Specimens in Mississippi were collected at blacklight traps and from flooded grass at the edge of shallow, swampy areas.

Distribution. The species occurs thoughout eastern North America (Smetana, 1985); Mississippi records are from throughout the state (Map 3).

Specimens examined: 129 (Appendix 3).

Subfamily Hydrophilinae

Genus *Hydrophilus* Müller

Hydrophilus Müller, 1764. Fauna Insectorum Fridrichsdalina....Hafniae et Lipsiae: 16.

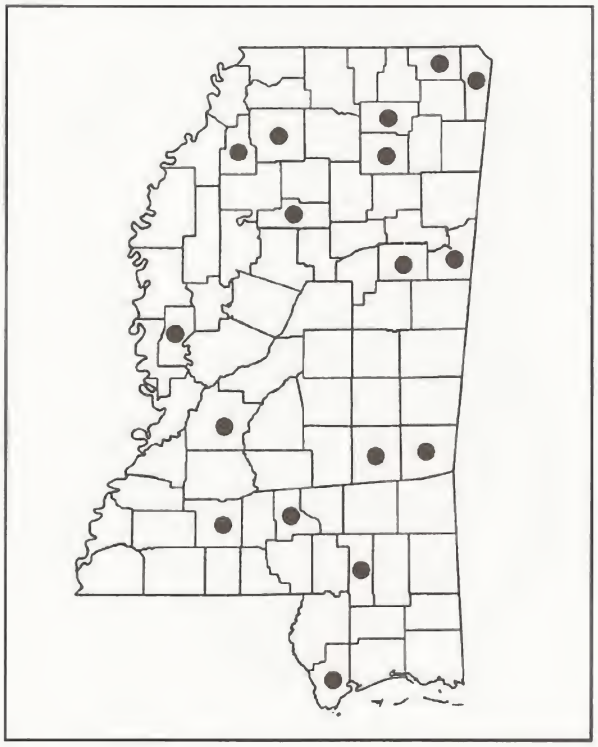
Diagnosis. Length 32-40 mm. Although similar in size to *Dibolocelus*, members of this genus have the median prosternal process closed and hooded anteriorly (Figure 7) and have a more linear body form. Also, the maxillary palpi of both sexes of *Hydrophilus* are slender (length/width = 8), whereas in male *Dibolocelus* they are flattened, stout, and much wider (Length/Width = 3.42).

Notes. The last comprehensive study of this genus was by Régimbart (1901, as *Stethoxus*). Only two species of *Hydrophilus, H. triangularis* and *H. insularis* Laporte, are known to occur in the United States (Young, 1954). *Hydrophilus ater* Olivier was reported as occurring throughout Alabama by Löding (1945) and from the southern states by Arnett (1983), probably in reference to the Löding records. No specimens of this species are currently present in the Löding collection at the University of Alabama. As *H. ater* is Central and South American in distribution and not known to occur in the United States, it appears that Löding's records are the result of misidentifications.

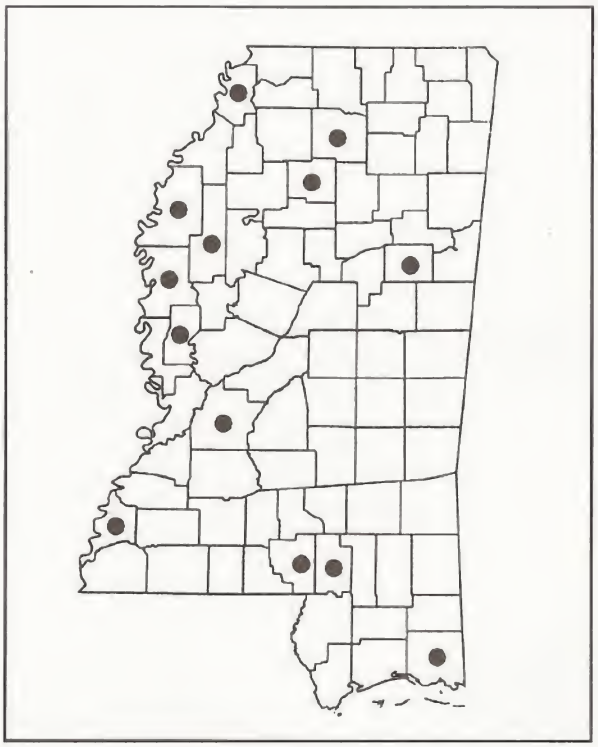
Hydrophilus triangularis Say
Figures 7, 19, Map 4

Hydrophilus triangularis Say, 1823. J. Acad. Natur. Hist. Philadelphia 3: 201.

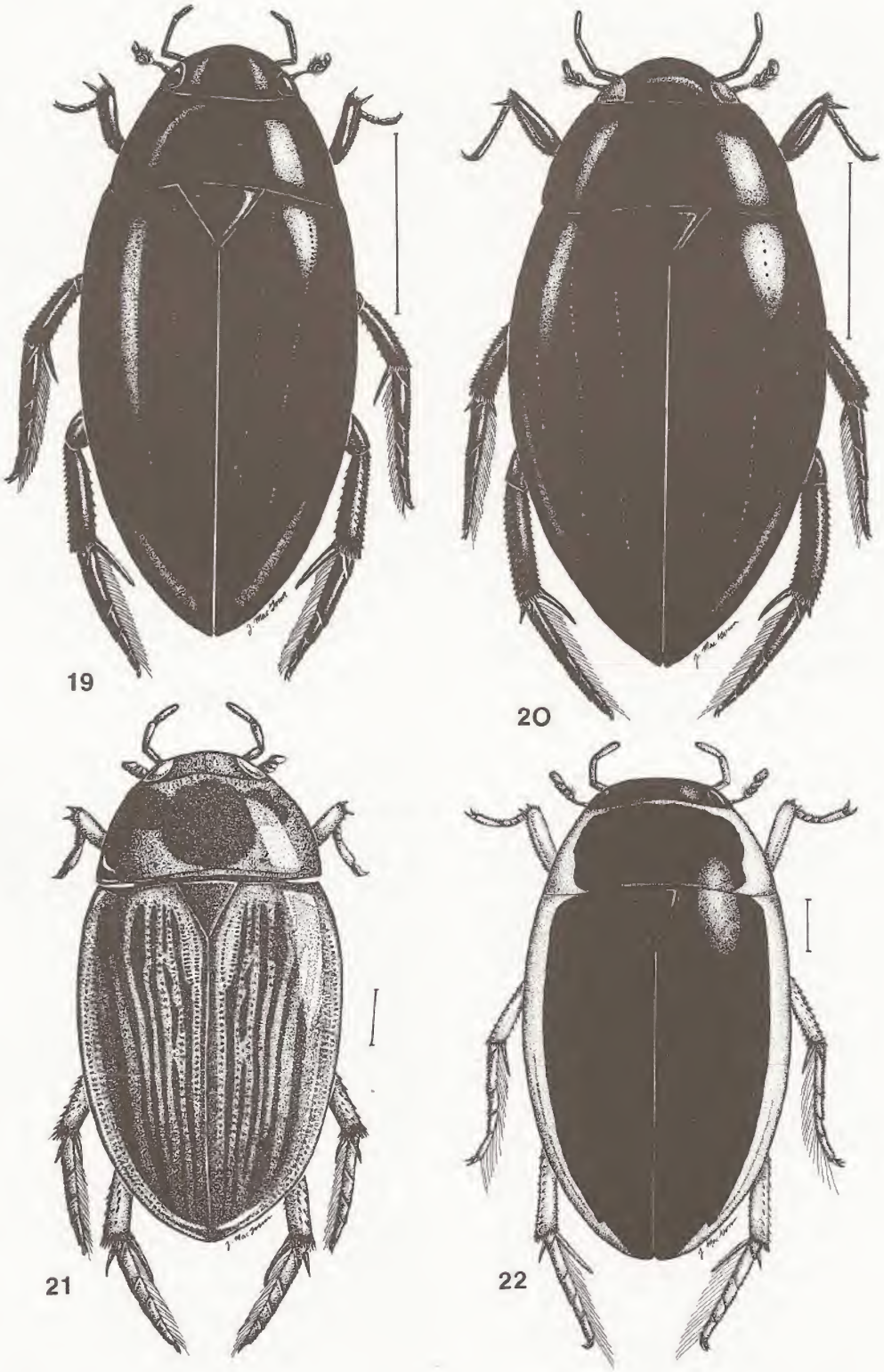
Diagnosis. Length 32-40 mm. The characters given in the generic diagnosis will differentiate this species from other hydrophilids in Mississippi. *Hydrophilus insularis* is known



Map 3. *Helophorus marginicollis.*



Map 4. *Hydrophilus triangularis.*



Figures 19 - 22. Representatives of genera. 19, *Hydrophilus triangularis*, scale line = 10 mm; 20, *Dibolocelus ovatus*, scale line = 10 mm; 21, *Tropisternus collaris*, scale line = 1 mm; 22, *Tropisternus lateralis nimbatus*, scale line = 1 mm.

from California and Mexico and also has been collected in Florida (Young, 1954); this species may occur in coastal Mississippi. *Hydrophilus insularis* has a fine tooth at the apex of each elytron that is absent in *H. triangularis*.

Notes. No specimens of *H. triangularis* were collected directly from an aquatic habitat during this study. All specimens were obtained from various light sources; however, blacklight traps normally attracted few individuals. Most specimens were collected at night during early spring and fall dispersal flight periods at mercury vapor lights.

Hydrophilus triangularis was found in weedy ponds and similar habitats in Florida by Young (1954). According to Smetana (1988), the species prefers large deep ponds. LaRivers (1954) reported this species from elevations up to 4,500 feet, and from hot springs with temperatures up to 39° C and pH of 8.5 in Nevada. This species made up 48% of the diet of some bullfrogs (*Rana catesbeiana*) in central Oklahoma farm ponds (McCoy, 1967). The life history and immature stages of this species were described by Wilson (1923a).

Distribution. *Hydrophilus triangularis* occurs from New York to California, Texas, and Florida. This species has been collected throughout most of Mississippi with the exception of many east-central and northeastern counties (Map 4), where few collections have been made during the beetles' dispersal period.

Specimens examined: 111 (Appendix 4).

Genus *Dibolocelus* Bedel

Dibolocelus Bedel, 1891. Revue d'Entomol. 10: 309,321.

Diagnosis. This genus is represented in the United States by a single species, *D. ovatus* (Gemminger and Harold); in Mississippi, this species is matched in size only by *H. triangularis*, but it is more robust than the latter. The prosternum has a medial sulcate process to accommodate the anterior edge of the mesosternal keel, but this process is not hooded or closed anteriorly (Figure 8) as it is in *Hydrophilus*. Also, the maxillary palpi of male *Dibolocelus* are much stouter (length/width = 3.42) than those of *Hydrophilus* (length/width = 8), which are very thin and narrow.

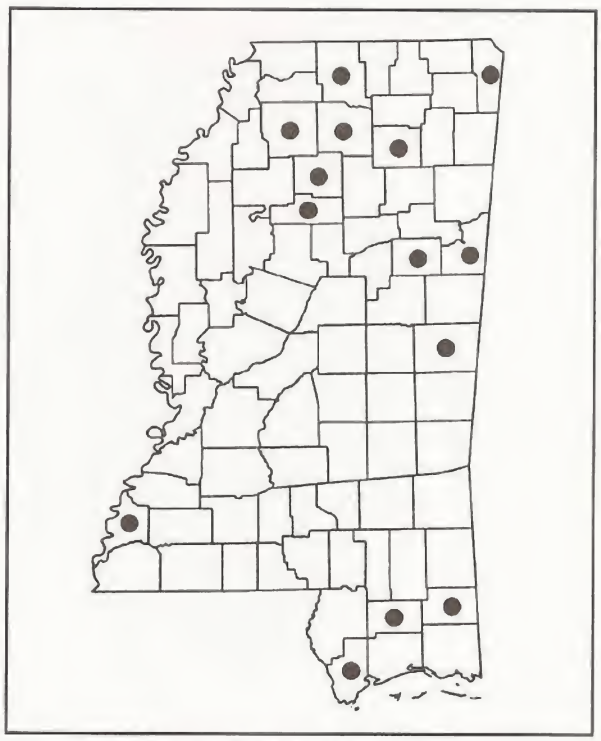
Notes. The last comprehensive treatment of this genus was by Régimbart (1901).

Dibolocelus ovatus (Gemminger and Harold)
Figures 8, 20, Map 5

Hydrophilus ovatus Gemminger and Harold, 1868. Catalogus Coleoptorum... Tom II: 476.

Diagnosis. Length 30-35 mm. The generic diagnosis should suffice to distinguish this species.

Notes. *Dibolocelus ovatus* is collected infrequently, and no individuals were collected from aquatic habitats during this study. Specimens are collected occasionally in blacklight traps. During early summer and fall dispersal flight periods, fair numbers were collected at lighted (mercury vapor) tennis courts. Young (1954) collected specimens from deep canals containing much vegetation in Florida, and Smetana (1988) stated that the species prefers larger, deeper, well-vegetated bodies of standing water. Immature stages of this species were described recently by Archangelsky and Durand (1992a).



Map 5. ***Dibolocelus ovatus.***

Distribution. This species ranges from New York to Michigan and south to Mississippi and Florida. Most specimens in Mississippi are from the northern third of the state, with single records from Adams and George counties (Map 5). Most likely, this discontinuous distribution does not reflect true distribution but rather the lack of collecting at critical times (flight periods) and chance, as specimens are not encountered frequently.

Specimens examined: 67 (Appendix 5).

Genus *Tropisternus* Solier

Tropisternus Solier, 1834. Ann. Soc. Entomol. France 3: 302.

Diagnosis. This genus is differentiated from most other members of the family by having the meso- and metasternum developed into a keel that projects caudally as a spine beyond the posterior margin of the first visible abdominal segment. The distinctive size (7.5-12 mm), the prosternum being sulcate medially for reception of the anterior portion of the sternal keel, and the ultimate segment of the maxillary palpus being as long or longer than the penultimate will differentiate *Tropisternus* from closely related genera. Males

can be recognized by the presence of an oblique tooth (absent in females) at the base of the inner claws of the middle and hind tarsi.

Notes. Fourteen species of *Tropisternus* occur in America north of Mexico, five of which are known from Mississippi. Species of *Tropisternus* in Mississippi inhabit many types of aquatic habitats, ranging from small puddles to large lakes and estuaries. Adults are collected most often from shallow water (less than 5 inches deep). Presence of organic debris or algae seems to be preferred, but individuals often are found in newly formed puddles and sandy lake margins where little or no vegetation is apparent.

Individuals collected with a D-frame net are often very active, and they may climb the side of the net bag and escape quickly, often flying. After the contents of the net are placed in sorting pans, the beetles may hide beneath the wet organic material accumulated during sampling and remain quiet until disturbed. When disturbed, the beetles often stridulate loudly. *Tropisternus* are strong swimmers and can scurry rapidly on land. Some care should be used in handling living specimens with the fingers, as the projecting ventral spine often has proven to be an effective protective device. Individuals of all species in Mississippi are attracted to light, and blacklight traps are especially effective.

Spangler (1960) provided an excellent account of the biology of this genus. He noted that adults of *Tropisternus* could be maintained on a diet of living and dead organic materials. Some green algae were found acceptable as food, as were leaves of *Ulmus, Acer,* and *Plantago,* which the beetles skeletonized by removing the epidermal tissue layers. Young (1958) discussed care and rearing of *Tropisternus* in the laboratory.

Key to Species of *Tropisternus* in Mississippi

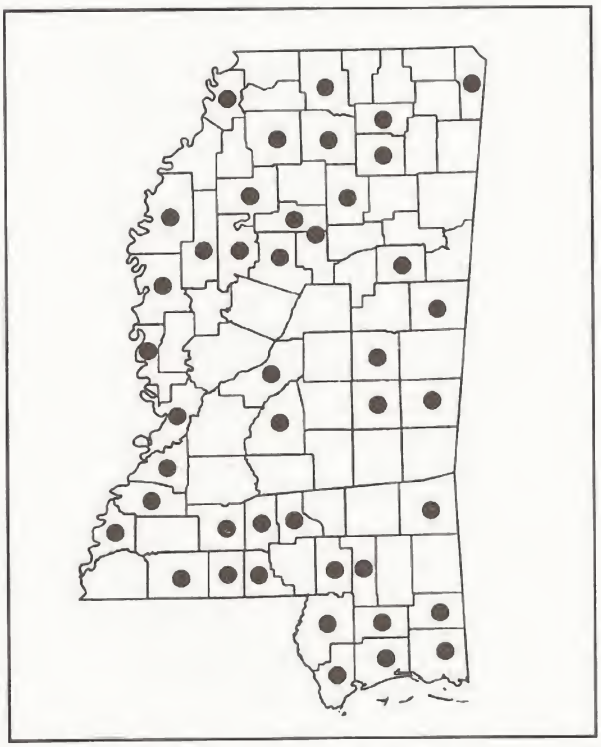
1. Elytra with longitudinal testaceous markings, at least laterally (sometimes not evident except with magnification) 2
   Elytra uniformly dark 3
2. Elytra with only lateral border testaceous; prosternal groove closed anteriorly (Figure 7); last (fifth) abdominal segment with small, posteriorly projecting spine; length 8-10 mm . . . . . *T. lateralis nimbatus* (Say)
   Elytra with numerous testaceous stripes on disk; prosternal groove open anteromedially (Figure 8); last abdominal segment lacking posteriorly projecting spine; length 8-11 mm . . . . . *T. collaris* (Fabricius)
3. Legs entirely dark; generally larger (9-12mm) . . . . . *T. natator* d'Orchymont
   Femora testaceous except at base; tibia either completely testaceous or testaceous medially; generally smaller (7-10.5 mm) 4
4. Tibia rufo-testaceous medially, with broad piceous bands at base and apex; spine of fifth abdominal sternum barely projecting, forming central ridge on sternite with only the apex of spine free; occurring throughout Mississippi; length 7-10.5 mm . . . . . *T. blatchleyi* d'Orchymont
   Tibia testaceous throughout, at most with small spot of black at base and apex; spine of fifth abdominal sternum free and distinctly projecting upwards from sternite; restricted to coastal and adjacent counties; length 8.5-10.5 mm . . . . . *T. quadristriatus* (Horn)

Tropisternus blatchleyi blatchleyi d'Orchymont
Map 6

Tropisternus blatchleyi d'Orchymont, 1922. Ann. Soc. Entomol. Belgique 62: 26.

Diagnosis. Length 7.0-10.5 mm. The bicolored femur and tibia and completely dark elytra distinguish this species. It also is separable from the other two species of *Tropisternus* in Mississippi with all-dark elytra by having the maxillary and labial palpi testaceous with the ultimate segment darkened in the apical third.

Notes. *Tropisternus blatchleyi* prefers shallow, lentic habitats with thick aquatic vegetation, but it can be found in depositional areas of lotic habitats, especially in vegetation. On Point Clear Island, Hancock County, Mississippi, several specimens were collected from brackish ponds ranging in salinity from 3.5 to 10.0 ppt (Lago and Testa, 1989).



Map 6. *Tropisternus blatchleyi.*

Distribution. This species occurs throughout Mississippi (Map 6) and most of the eastern United States. It was recorded from Horn Island, Mississippi, by Richmond (1962).

Specimens examined: 293 (Appendix 6).

Tropisternus collaris (Fabricius)
Figure 21, Map 7

Hydrophilus collaris Fabricius, 1775. Systema Entomologiae...Flensburgi et Lipsiae: 66, 229.

Diagnosis. Length 7.0-11.0 mm. The pattern of alternating light and dark stripes on the elytra readily differentiates this species from other southeastern *Tropisternus*. Although more robust, some specimens of *T. collaris* that have reduced, pale elytral stripes are similar in appearance to *T. lateralis nimbatus*, but examination of the prosternum and last abdominal segment will differentiate the two.

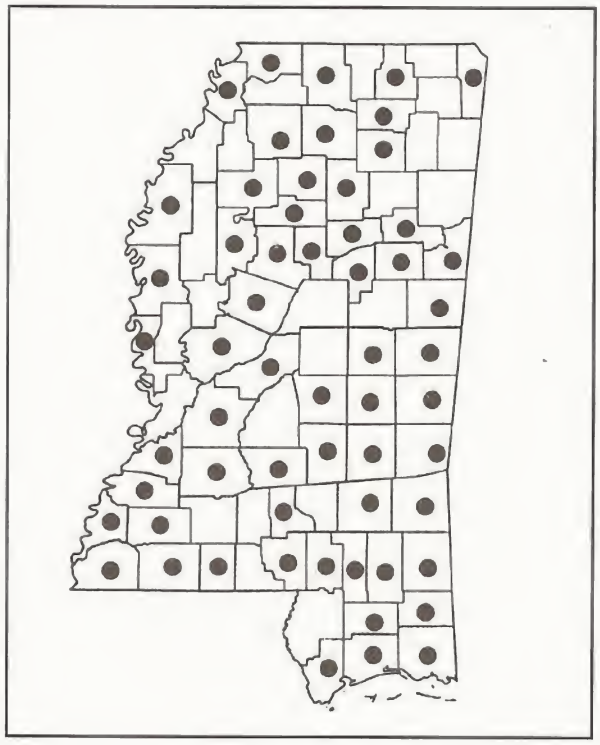
Notes. Several subspecies of *T. collaris* have been recognized, including *viridis* Young and Spangler, *striolatus* LeConte, and *mexicanus* Laporte, all of which occur in the southeastern United States. These three intergrade in Mississippi, and their separation seems unjustified here because typical populations simply are not found. The valid name of this species is unsettled, and the synonymy currently is being studied by P.J. Spangler (personal communication). At present, *collaris* is the accepted specific epithet.

Dancis (1967) and Young (1965, 1969) studied the appearance, fertility, and viability of offspring of crosses between various subspecies, and concluded that there were distinct differences in viability of offspring of particular crosses. In considering the significance of differential melanization of this and other aquatic beetles, Young and Spangler (1956) and Young (1960b) hypothesized that melanization was controlled genetically rather than environmentally, and that predation was important as a selective force in the system.

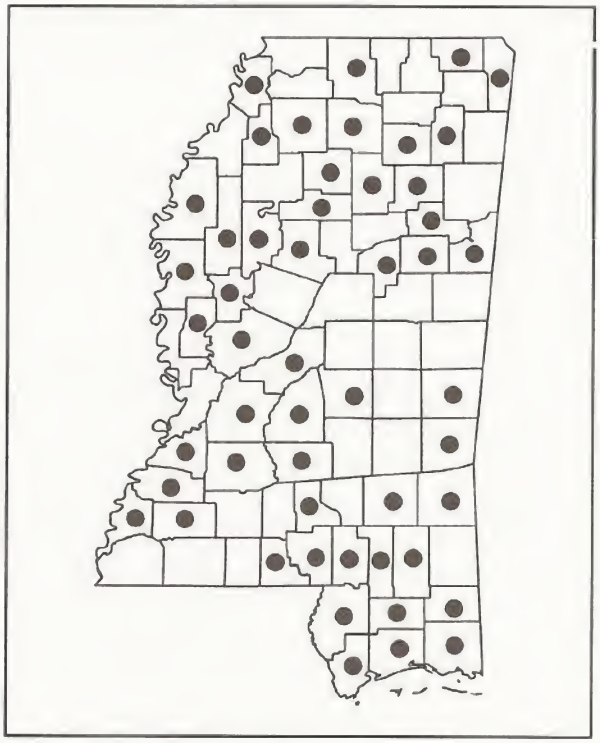
This species occurs in a variety of aquatic habitats. Interestingly, specimens often were found in lentic habitats into which many pine needles had fallen. This indicates an apparent unique tolerance to pine needle leachate that is not found in the other species in Mississippi because other species of hydrophilids were encountered rarely in this type of habitat. On Point Clear Island, specimens were collected only from a fresh water, artesian-fed pond and never from brackish ponds nearby (Lago and Testa, 1989).

Distribution. This species occurs in the southeastern quarter of the United States, Mexico, and Central America. It was recorded from Horn Island, Mississippi by Richmond (1962) as *Tropisternus mexicanus striolatus* and *T. striolatus*; the species now is known to occur throughout the state (Map 7).

Specimens examined: 1,248 (Appendix 7).



Map 7. *Tropisternus collaris.*



Map 8. *Tropisternus lateralis nimbatus.*

Tropisternus lateralis nimbatus (Say)

Figure 22, Map 8

Hydrophilus nimbatus Say, 1823. J. Acad. Natur. Hist. Philadelphia 3: 201.

Diagnosis. Length 7.5-10.0 mm. *Tropisternus lateralis nimbatus* is recognized easily by the single, pale lateral stripe on each elytron. It could be confused with specimens of *T. collaris* that have the pale stripes of the disk of the elytra darkened, but the prosternal process that is hooded anteriorly and the spine of the last abdominal segment easily distinguish *T. lateralis*.

Notes. Duges (1884) described the larva and pupa of *T. lateralis*, and Wilson (1923b) gave a detailed account of its life history. This common species can be collected in nearly any shallow aquatic habitat. Like most other hydrophilids, it prefers areas with submerged or emergent vegetation, but individuals can be collected frequently from barren margins of ponds, ditches, and backwater areas of lotic systems. They are attracted often to artificial light in large numbers. This species is found commonly in newly formed and ephemeral habitats, appearing to be a primary colonizer of new aquatic environments (see also, Young, 1960a). Specimens were collected on several occasions from brackish ponds on Point Clear Island, Hancock County, indicating it is able to tolerate salinities of at least 6.0 ppt (Lago and Testa, 1989).

Distribution. This species occurs throughout the United States (except the Pacific Northwest), Mexico, and Central America. It occurs throughout the state (Map 8), including Horn Island (Richmond, 1962).

Specimens examined: 732 (Appendix 8).

Tropisternus natator d'Orchymont

Map 9

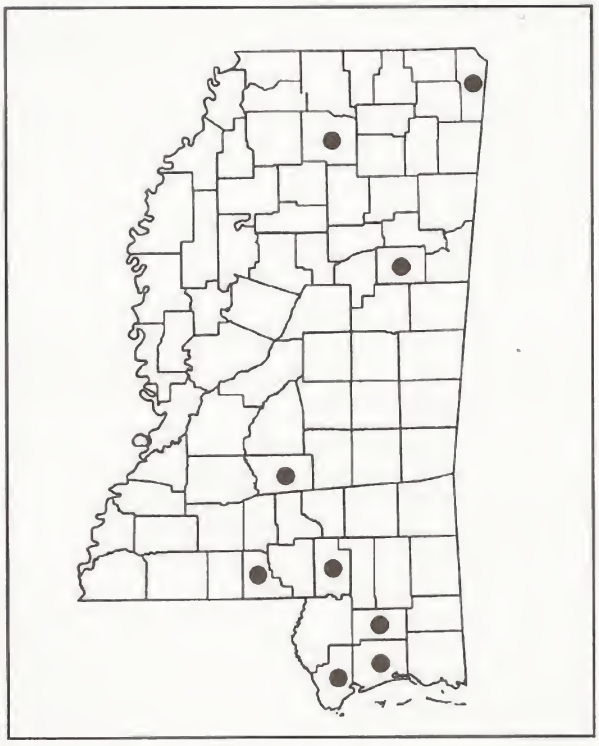
Tropisternus natator d'Orchymont, 1938. Ann. Soc. Entomol. Belgique 78: 436.

Diagnosis. Length 8.5-12.0 mm. The completely dark elytra and legs, combined with the larger size, easy differentiate this species from other *Tropisternus* in Mississippi. The maxillary palpi are deep reddish-brown, with the ultimate segment nearly entirely black, and the labial palpi are black.

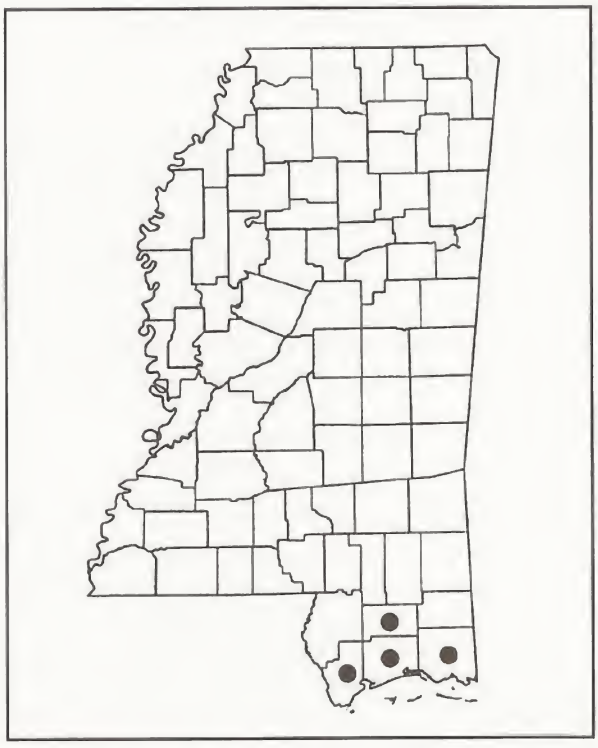
Notes. *Tropisternus natator* is not encountered frequently, but it appears to primarily inhabit vegetated margins of ponds. One specimen from Point Clear Island, Hancock County, was collected from a brackish pond (Lago and Testa, 1989).

Distribution. This species occurs throughout the eastern half of the United States. Populations in Mississippi are scattered widely and none was encountered along the Mississippi River or in the east-central counties (Map 9).

Specimens examined: 35 (Appendix 9).



Map 9. ***Tropisternus natator.***



Map 10. ***Tropisternus quadristriatus.***

Tropisternus quadristriatus (Horn)
Map 10

Hydrophilus quadristriatus Horn, 1871. Trans. Amer. Entomol. Soc. 3: 331.

Diagnosis. Length 8.5-10.5 mm. The dark elytra and testaceous legs differentiate this species from others of the genus occurring in Mississippi. Additionally, it differs from the other species with unicolorous elytra in that the maxillary and labial palpi are entirely testaceous, although slightly darkened apically in some individuals.

Notes. Although occasionally found in freshwater ponds, the species has been reported to be typical of the fauna in brackish habitats, such as margins of estuaries and coastal pools (Matta, 1974). During this study, specimens of this species were collected in large numbers with blacklight traps in tidal marshes, and they represented a large percentage of the *Tropisternus* collected from both brackish and freshwater ponds during a faunal survey of Point Clear Island, Hancock County (Lago and Testa, 1989)

Distribution. This species is restricted to coastal areas along the eastern and western United States and Mexico. In Mississippi, this species was recorded previously from Horn Island (Richmond, 1962), and it is known now to occur in the three coastal counties and also in Stone County (Map 10).

Specimens examined: 518 (Appendix 10).

Genus *Hydrobiomorpha* Blackburn

Hydrobiomorpha Blackburn, 1889. Proc. Linn. Soc. New South Wales 3: 805-875.

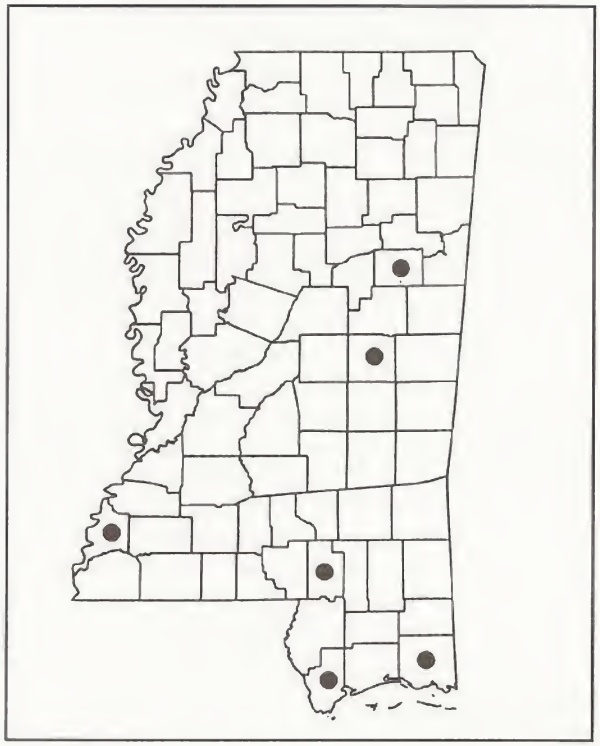
Diagnosis. Species in this genus are distinguished by their large size, presence of a mesosternal keel that projects beyond the posterior coxae but not past the first abdominal segment, tectiform (roof-like) prosternum with a long posteriorly projecting spine, broadly emarginate clypeus that exposes the articulation of the labrum (Figure 9), and bilobed seventh segment of the antennae (Fig 10). *Hydrobiomorpha* can be mistaken easily for *Hydrochara*, but the emarginate clypeus of the former readily differentiates these similar genera.

Hydrobiomorpha casta (Say)
Figures 9, 10, 23, Map 11

Hydrophilus castus Say, 1835. Boston J. Natur. Hist. 1: 170.

Diagnosis. Length 13-17 mm. The characters in the generic diagnosis sufficiently distinguish this species, the only member of the genus occurring in North America.

Notes. Few details are known of the biology of this species, although the larva was described by Spangler (1973). Young (1954) reported specimens from cypress ponds, roadside ditches, sinkhole ponds, and flatwood swamps. All of the specimens from Mississippi seen during this study were collected at light. A large series of these came from a light trap at a small, eutrophic, woodland lake in Adams County, and others came from a large, well-established lily pond in Lamar County.



Map 11. *Hydrobiomorpha casta.*

Distribution. This species ranges from Louisiana to Florida and South Carolina, and occurs in Cuba, Mexico, Guatemala, and Panama. Richmond (1962) collected a specimen on Horn Island, Hancock County, and it occurs in a few other, widely scattered areas within the state (Map 11).

Specimens examined: 26 (Appendix 11).

Genus *Hydrochara* Berthold

Hydrochara Berthold, 1827. Latreille's naturliche Familien des Thierreiches 8: 355.

Diagnosis. Species in this genus (Figure 24) are separable from all other members of the subfamily Hyrophilinae, except *Hydrobiomorpha*, by the tectiform (roof-like), carinate prosternum. The truncate clypeus and nonspinose prosternal process differentiates *Hydrochara* from *Hydrobiomorpha*. Also, the seventh antennomere is only slightly asymmetrical in *Hydrochara* (Figure 11), whereas in *Hydrobiomorpha*, it is distinctly asymmetrical and deeply divided into two lobes (Figure 10). The external similarity of the two genera in other respects is remarkable.

Sexes can be differentiated by the shape of the protarsal claws. In females, the claws are curved evenly, and the apices

of the basal teeth are acute; in males, the claws are recurved strongly, and the apices of the basal teeth are rounded bluntly.

Identification of species is based primarily on characters of the maxillary palpi, sternal keel, and male genitalia. The similarity of *H. soror* and *H. spangleri* necessitates the extraction of male genitalia on these specimens.

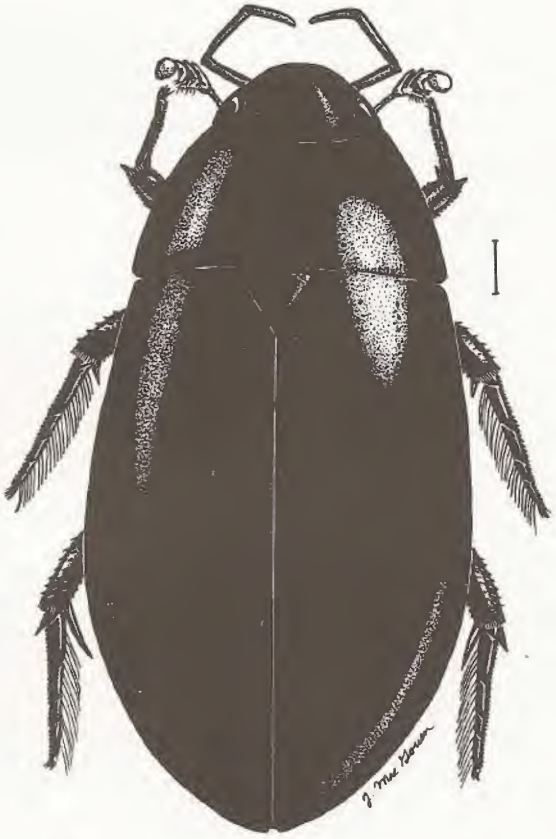
Notes. Smetana (1980) revised this genus for the world and recognized 21 species. Little is known about the biology of this group other than they are aquatic and occur nearly exclusively in shallow standing waters, seeming to prefer eutrophic habitats. Most specimens from Mississippi were collected at artificial light, with blacklights and store lights attracting large numbers of individuals. Matta (1974) found *Hydrochara* to be most abundant in deep woodland pools with rotting leaves on the bottom. Malcolm (1971) found them to be common in farm ponds. During this study, few specimens were collected directly from aquatic habitats.

Richmond (1920) described the immature stages of a species of *Hydrochara* (as *Hydrophilus obtusatus* Say), but a specific name cannot be assigned because several species are known now in the area where the specimens were collected (New York). The same can be said for Wilson's (1923b) larval descriptions (Iowa).

Key to Species of *Hydrochara* in Mississippi
(modified from Smetana, 1980)

1. Maxillary palpus distinctly shorter than width of clypeus at anterior margin of eyes, penultimate segment only slightly longer than ultimate; body length 16.0-20.0 mm ..... *H. brevipalpus* Smetana

   Maxillary palpus at least as long as width of clypeus at anterior margin of eyes; body length usually less than 17.0 mm 2



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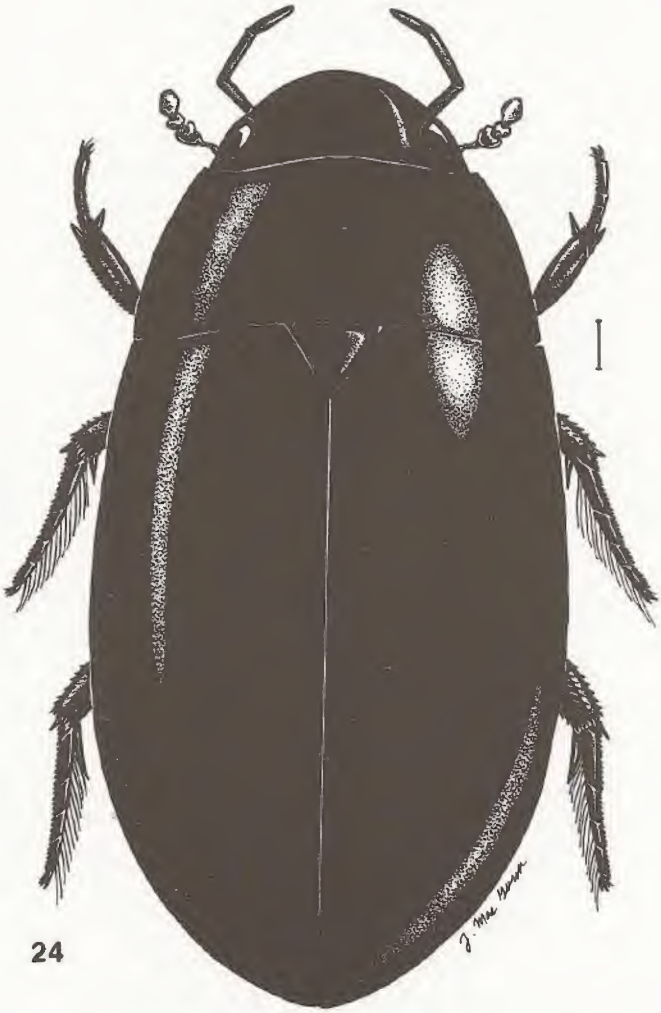

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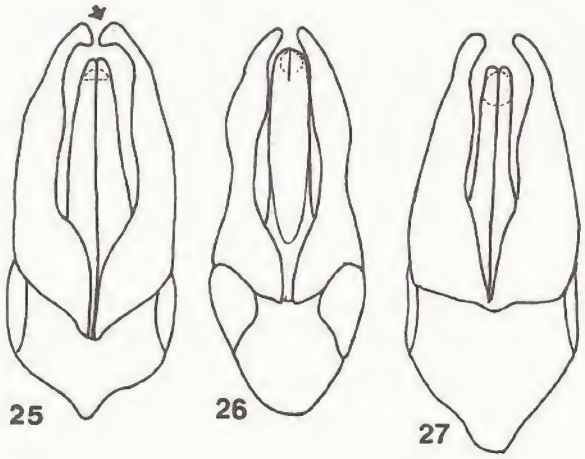
Figures 23 - 24. Representatives of genera, scale line = 1 mm. 23, *Hydrobiomorpha casta*; 24, *Hydrochara soror.*



Figures 25 - 27. Male genitalia of *Hydrochara* species, dorsal view. 25, *Hydrochara occulta*; arrow = recurved apex of paramere, 26, *Hydrochara spangleri*; 27, *Hydrochara soror.*

2. Metasternal portion of sternal keel distinctly widened, approximately two times width of mesosternal portion at its widest point; ultimate segment of maxillary palpus not darkened apically; male genitalia with parameres medially recurved apically, formed by an expanded, acutely angled, inner lobe (Figure 25); length 12.0-17.0 mm; coastal species .... *H. occulta* (d'Orchymont)

   Metasternal portion of sternal keel at most only feebly dilated, never reaching 1.5 times width of mesosternal portion at its widest point; male genitalia without medially recurved apices, never with acutely angled lobe 3

3. Maxillary palpus with ultimate segment not darkened apically, with penultimate segment about 1.5 times length of ultimate segment; dorsal surface of median lobe of male genitalia broadly excavated basally (Figure 26); length 12.0-17.0 mm ..... *H. spangleri* Smetana

   Maxillary palpus with ultimate segment darkened apically, with penultimate segment shorter, approximately 1.3 times length of ultimate segment; dorsal surface of median lobe of male genitalia not excavated basally (Figure 27); length 14.0-19.0 mm .... *H. soror* Smetana

Hydrochara brevipalpis Smetana
Map 12

Hydrochara brevipalpis Smetana, 1980. Mem. Entomol. Soc. Canada 111: 22.

Diagnosis. Length 16-20 mm. The shortened palpal segments and larger size readily differentiate this species from all others in the genus.

Notes. During this study, specimens were collected at blacklight traps placed near blackwater streams and a large, woodland seep area near a small lake and at other fluorescent and incandescent lights.

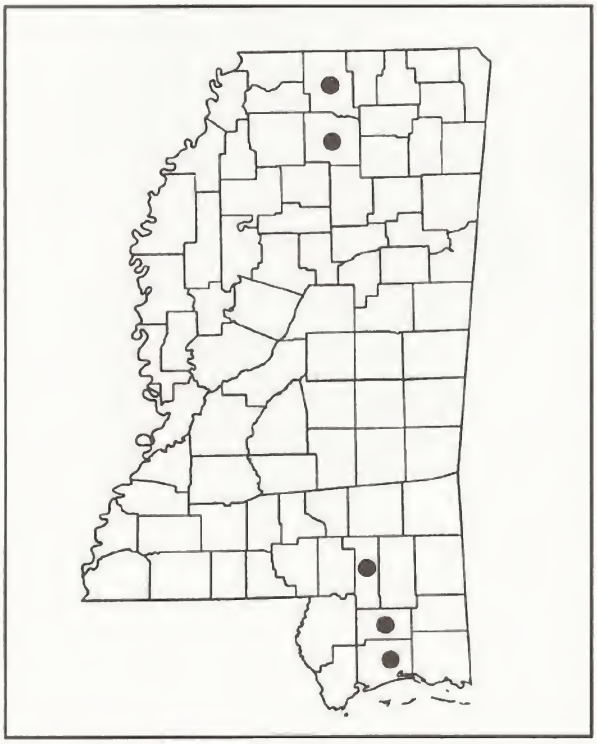
Distribution. This species occurs throughout the eastern third of the United States (Smetana, 1980). The disjunct southern and northern Mississippi distribution shown for *H. brevipalpis* (Map 12) is probably an artifact of more intensive field work in these areas combined with the apparent rarity of the species in the state.

Specimens examined: 8 (Appendix 12).

Hydrochara occulta (d'Orchymont)
Figure 25

Hydrophilus occultus d'Orchymont, 1933. Ann. Entomol. Soc. Belgique 73: 310.

Diagnosis. Length 12-17 mm. The greatly widened sternal keel (metasternal portion twice as wide as mesosternal portion) and medially recurved apices of the aedeagal parameres differentiate this species from other *Hydrochara* in Mississippi. Another species with a widened sternal keel, *H. leechi* Smetana occurs as close as Texas, Oklahoma, and Missouri, but it has not been reported yet from a state neigh-



Map 12. *Hydrochara brevipalpus.*

boring Mississippi. The sternal keel of *H. leechi* is only about 1.5 times as wide on the metasternum as on the mesosternum, and the parameres of that species are not recurved medially at their apex as they are in *H. occulta*.

Notes. Although attracted to blacklight traps (Smetana, 1980), *H. occulta* has not been collected yet in Mississippi.

Distribution. *Hydrochara occulta* appears to prefer coastal habitats from eastern Texas to southern Florida and northward along the Atlantic Coast to Massachusetts, however, three noncoastal records are available (central Texas, Oklahoma, and Tennessee) (Smetana, 1980). Although not yet collected in Mississippi, it probably occurs in the coastal counties. Smetana (1980) examined two specimens from New Orleans, Louisiana, and these are the geographical records nearest to Mississippi.

Hydrochara soror Smetana
Figures 11, 24, 27, Map 13

Hydrochara soror Smetana, 1980. Mem. Entomol. Soc. Canada 111: 30.

Diagnosis. Length 14-19 mm. *Hydrochara soror* is similar to *H. spangleri*, but it can be separated from the latter by having a darkened apex of the ultimate segment of the maxillary palpus and, in the male genitalia, a smoothly convex, dorsal surface of the base of the median lobe (Figure 27), rather than excavated as in *H. spangleri* (Figure 26).

Notes. This is the most common species of *Hydrochara* in Mississippi. During this study, the species was attracted in large numbers to blacklight and other artificial lights, where most specimens were collected. One specimen was hand-collected from thick, grassy vegetation in a roadside pool, another from shallow water at the margin of a lake, and a series of eight was collected from the grassy bottom of a small, woodland pond in about 2 inches of water.

Distribution. *Hydrochara soror* is distributed widely in the eastern half of the United States (Smetana, 1980), and it occurs throughout Mississippi (Map 13).

Specimens examined: 261 (Appendix 13).

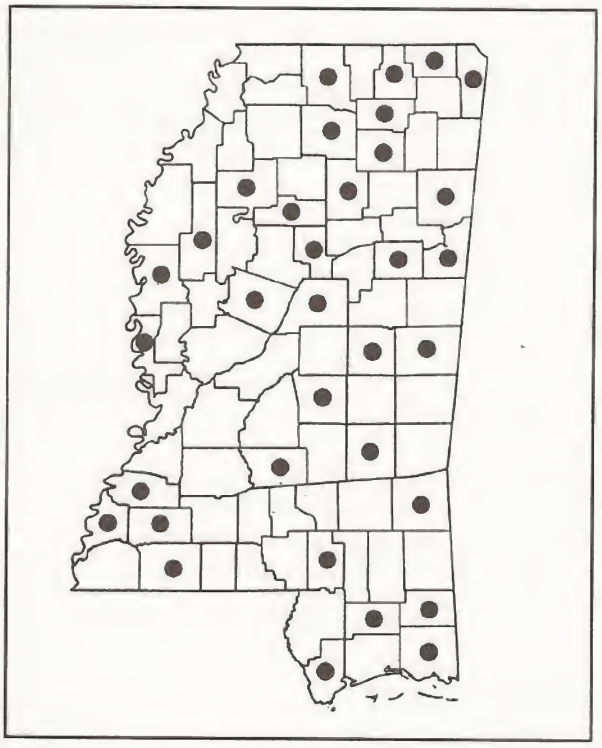
Hydrochara spangleri Smetana
Figure 26, Map 14

Hydrochara spangleri Smetana, 1980. Mem. Entomol. Soc. Canada 111: 34.

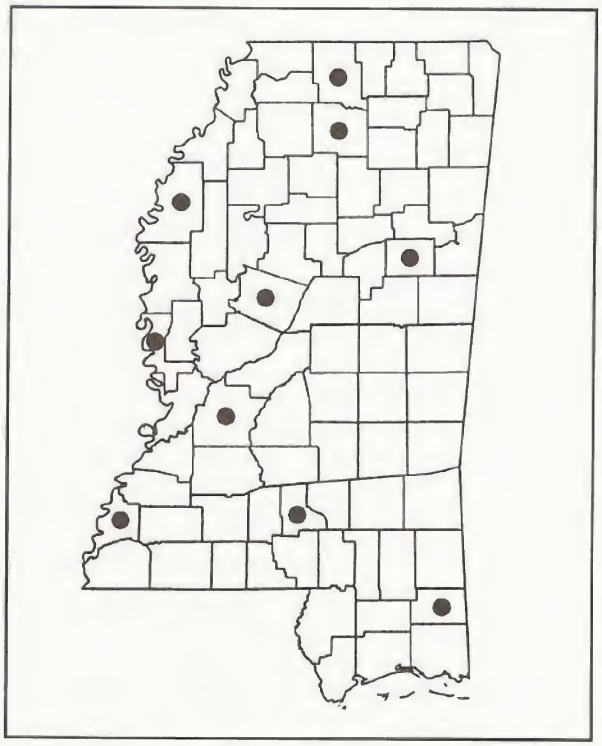
Diagnosis. Length 12-18 mm. Similar to *H. soror, H. spangleri*; differs in having a uniformly pale apex of the ultimate palpal segment and an excavated dorsal surface of the base of the aedeagus.

Notes. This species was collected only at blacklight traps during this study, usually near permanent aquatic habitats such as lakes, ponds, and bayous in floodplains.

Distribution. *Hydrochara spangleri* is distributed widely in the eastern half of the United States, excluding the Atlan-



Map 13. ***Hydrochara soror.***



Map 14. ***Hydrochara spangleri.***

tic Coast but including Florida (Smetana, 1980). Its distribution in Mississippi is widespread but patchy, and this probably reflects collecting activity more than actual distribution of the species (Map 14).

Specimens examined: 64 (Appendix 14).

Subfamily Sphaeridiinae

Genus *Phaenonotum* Sharp

Phaenonotum Sharp, 1882. Biologia Centrali-Americana, Coleoptera I,2: 97.

Diagnosis. Specimens of *Phaenonotum* are very convex in profile, black, and less than 4 mm in length. Lacking elytral striae (with the elytra confusedly punctate), members of this genus closely resemble *Paracymus*, *Crenitulus*, and *Anacaena*, but the former differ in having the first tarsomere longer than the second, the slightly larger size, and more convex form of the body.

Notes. Smetana (1978) revised the subfamily Sphaeridiinae for America north of Mexico, including the genus *Phaenonotum*. Only two species of *Phaenonotum* are known to occur in the United States.

Key to Species of *Phaenonotum* in Mississippi

1. Length 2.3-4.0 mm. Clypeus finely and densely punctate apically. Widely distributed in Mississippi .... *P. exstriatum* (Say)

   Length 1.6-2.4 mm. Clypeus finely but rather sparsely punctate apically; possibly occurs in southeastern Mississippi ..... *P. minor* Smetana

Phaenonotum exstriatum (Say)

Figures 12, 28, Map 15

Hydrophilus exstriatus Say, 1835. Boston J. Natur. Hist. 1: 171.

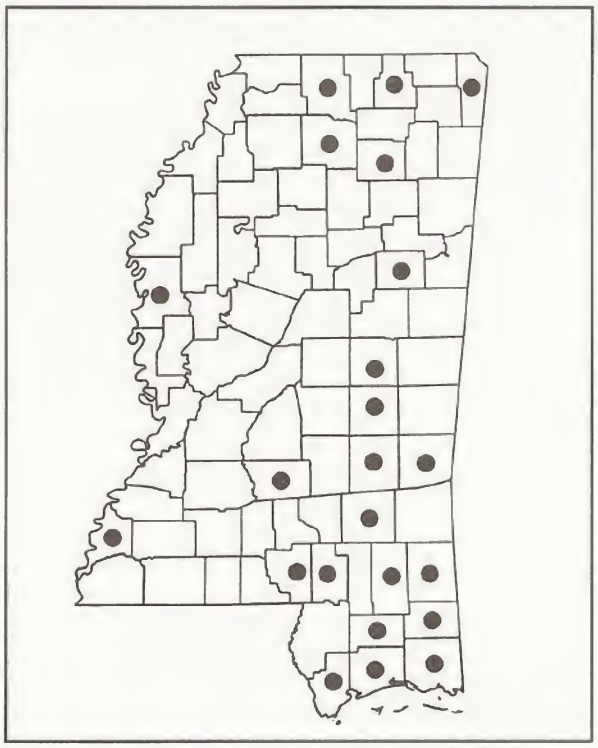
Diagnosis. Length 2.3-4.0 mm. *Phaenonotum exstriatum* is differentiated from *P. minor* by its larger size and a clypeus that is more densely punctate. The male genitalia of the two species are similar.

Notes. The immature stages and biology of *P. extriatum* have been described by Archangelsky and Durand (1992b).

Individuals were observed on several occasions moving into and out of water on emergent vegetation, and this may be the method used to replenish their air supply. They do not appear able to swim.

Many individuals were observed in a small, spring-fed, stock pond with emergent grass. Even larger numbers were observed along the margin of a small lake with a dense stand of *Ludwigia* bordering the shore. The substrate in the latter area was mud and decaying organic material, including rotting stems of *Ludwigia*. Many individuals were seen emerging and then returning to the water on the *Ludwigia*.

Specimens were often collected at blacklight traps near lakes and well-established ponds (ponds with waterlilies were frequently productive).



Map 15. ***Phaenonotum exstriatum.***

Distribution. *Phaenonotum exstriatum* occurs from Panama northward through Mexico into the southern and eastern United States, from Arizona to Florida and northward to Michigan and New York (Smetana, 1978). Specimens were collected often in eastern Mississippi, but few records were obtained from the western half of the state (Map 15).

Specimens examined: 68 (Appendix 15).

Phaenonotum minor Smetana

Phaenonotum minor Smetana, 1978. Mem. Entomol. Soc. Canada 105: 20-21.

Diagnosis. Length 1.6-2.4 mm. The smaller size, sparse punctation apically on clypeus, and more globose form differentiate this species from *P. exstriatum.*

Notes. Smetana (1978) stated that the only habitat data he had seen for the species was "litter under pine magnolia fern;" however, the locality label he cited for a specimen collected in Alabama included "(Fish Ponds)." It is not known if this species is attracted to light.

Distribution. Currently known only from Florida and southwestern Alabama (Smetana, 1978), this species may occur in southeastern Mississippi.

Subfamily Berosinae

Genus *Berosus* Leach

Berosus Leach, 1817. The Zoological Miscellany. Vol.3: 92.

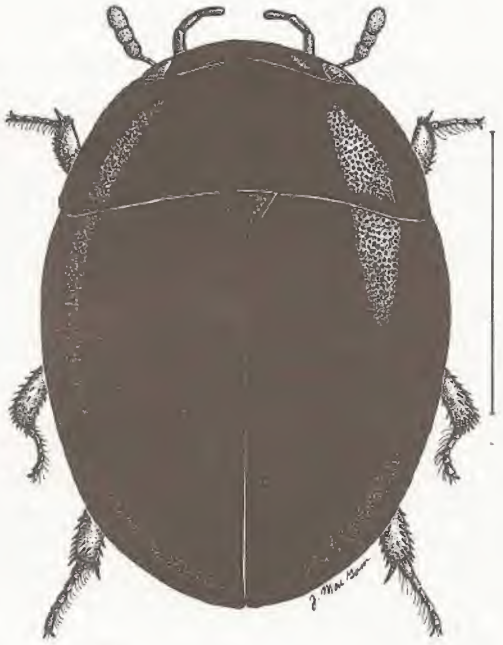
Diagnosis. The highly convex form, deflexed head, and distinctive coloration of members of this genus (Figure 29) differentiate them from species in all other genera. Adults of *Berosus* have yellowish to reddish-brown elytra with dark spots that vary in pattern and distinctness among species. The head normally is deflexed strongly, the eyes are protuberant, and the posterior tibiae are lined with a fringe of long, "swimming" setae. Sexual dimorphism is apparent with protarsomeres being expanded and disc-like in males and unmodified in females.

The character states of the teeth in the abdominal emargination of the fifth abdominal sternum (Figures 30 and 31) are important for identification of the species. In some species, there is only a single tooth or lobe at the center of the emargination, whereas in others, there are two teeth. There may be a median carina on the fifth sternum that slightly projects above the emargination, and this can give the appearance of only a single tooth when, in fact, there are two. Care must be taken, therefore, to examine this character closely.

Notes. Van Tassell (1966) revised the North American species of this genus, but that work has not been published. Wilson (1923b) and Richmond (1920) described immature stages and behavior of some species of *Berosus* occurring in Mississippi.

Species of *Berosus* are good swimmers and are able to dive easily from the water's surface, an ability shared with species in only a few other genera of Hydrophilidae. They are found normally in shallow water with rooted vegetation, but also are collected often from submerged mats of algae at various depths. When captured, adults may "play dead," or more appropriately, "play snail." Stationary *Berosus* closely resemble small pond snails that often occur in the same sample, thus, the beetles can be overlooked. Larger *Berosus* often stridulate audibly if they are trapped within an algal mat or other material in the sample or if held with fingers or forceps.

Richmond (1920) noted that adults in aquaria consumed decaying leaves of moneywort, eating holes through the leaves. He also noted an almost incessant action of the beetles' hind legs during their feeding. The front two pairs of legs were used to hold the plant while the swimming setae



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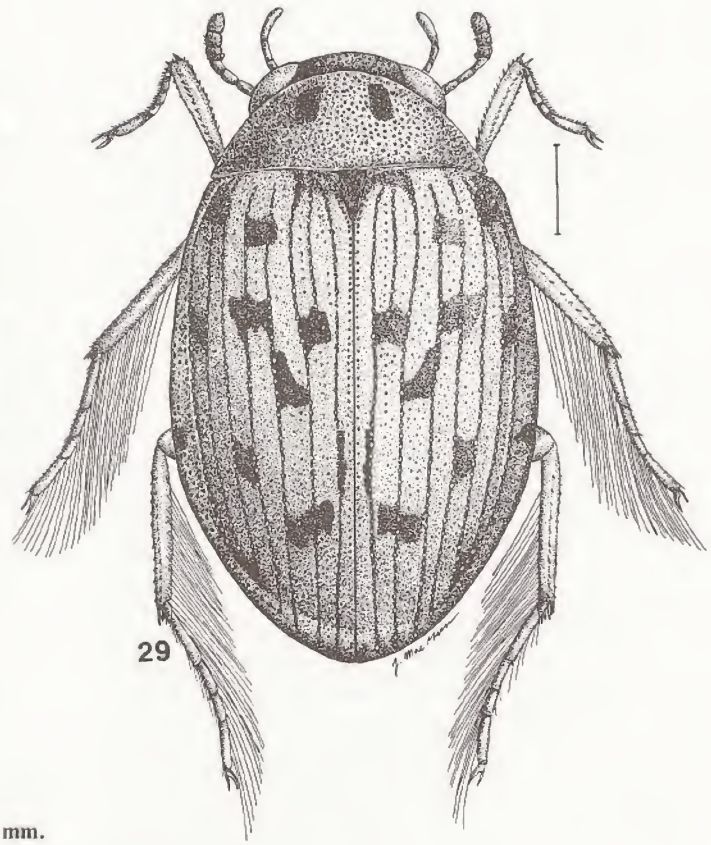

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Figures 28 - 29. Representatives of genera, scale line = 1 mm. 28, *Phaenonotum exstriatum*; 29, *Berosus pantherinus*.

of the posterior pair were swept down and across the air film covering the abdomen. This possibly aids in oxygenation of the film, allowing the beetles to remain underwater for extended periods of time.

Key to Species of *Berosus* in Mississippi
(modified from Van Tassel, 1966)

1. Apex of each elytron deeply emarginate, forming two spines (Figure 32); apical emargination of fifth visible abdominal sternite with two, broadly rounded lobes at center .....*B. pugnax* LeConte

   Elytral apices entire, sutural angle may be acute; emargination of fifth visible abdominal sternite variable, usually sharply toothed medially 2

2. Emargination of fifth visible abdominal sternite with two small teeth centrally (Figure 30) (sometimes hidden behind enlarged sternal carina and appearing as single tooth) 3

   Emargination of fifth visible sternite with one central tooth (Figure 31) or simply truncate.....6

3. Pronotum and elytra of females and pronotum only of males (expanded protarsi) microreticulate throughout; elytral striae variable.....*B. infuscatus* LeConte

   Pronotum of female only lightly microreticulate at most, elytra shining; pronotum and elytra of male shining; elytral striae variable 4

4. Elytral striae indistinct or lacking, composed of elongate punctures on disc, barely impressed laterally; punctures of elytral intervals much smaller than those of discal striae; elytral apices slightly divergent, each apex rounded, never toothed medially .....*B. corrini* Wooldridge

   Elytral striae distinctly impressed; punctures of elytral intervals subequal to or larger than those of discal striae; elytral apices slightly divergent at suture; in some females, apices with small medial tooth at suture 5

5. Elytral apices divergent in apical fourth, evenly rounded in both sexes (Figure 33); elytra usually without distinct, piceous lateral spot at middle (plectral area); setigerous punctures of odd intervals (i.e., 1, 3, 5, 7) of same size as adjacent punctures (difficult to see without comparative material).....*B. ordinatus* LeConte

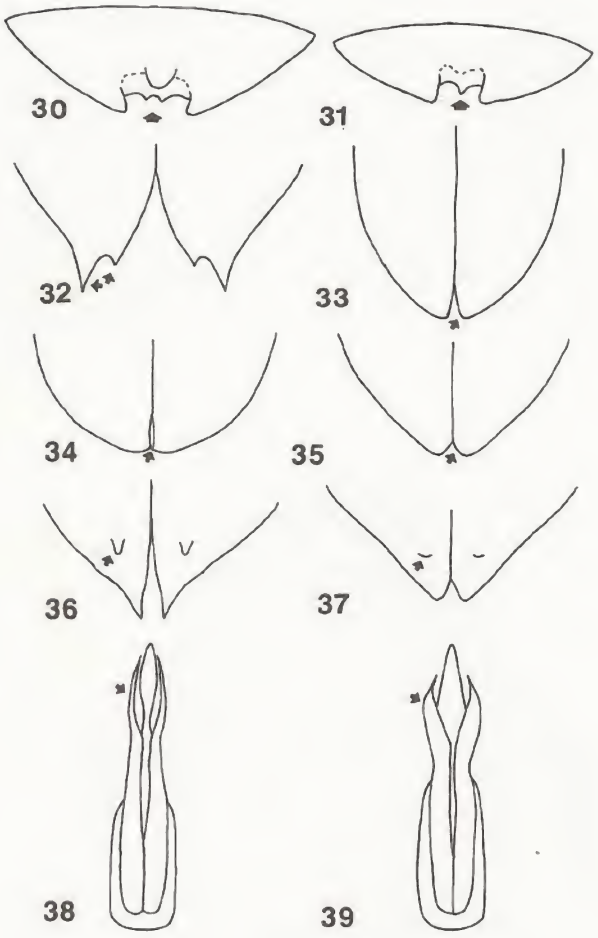
   Elytral apices of females with small medial tooth at suture (Figure 34); elytral apices of males not or only slightly divergent (Figure 35); elytra with distinct, piceous lateral spot in plectral area; setigerous punctures of odd intervals larger than adjacent punctures, as large as those of discal striae .....*B. striatus* (Say)

6. Elytra immaculate or with common, central dark spot; elytral apices never prolonged distally; median lobe of male genitalia with dorsal tuft of setae near center; head and scutellum brownish-testaceous; length 2.0-3.5 mm. .....*B. exiguus* (Say)

   Elytra with numerous darkened spots; elytral apices often prolonged in females; median lobe of male genitalia never tufted; head often piceous; scutellum color variable; length usually greater than 3.5 mm 7

7. Elytral apices prolonged in both sexes, especially so in females, usually with small tubercle or bump near suture (Figures 36 and 37); scutellum brownish; parameres of male genitalia extremely slender at apices (Figure 38) .....*B. aculeatus* LeConte

   Elytal apices rounded in male, may be prolonged some-



Figures 30 - 39. Characters for identifying *Berosus* species. 30 - 31, apical emargination of abdomen, 30, *Berosus* species with two teeth (arrow), 31, *Berosus* species with one tooth (arrow); 32 - 37, apices of elytra, 32, *Berosus pugnax*, arrows = two spines of apex, 33, *Berosus ordinatus*, arrow = rounded divergent apex, 34, *Berosus striatus*, female, arrow = tooth of apex, 35, *Berosus striatus*, male, arrow = rounded apex, 36, *Berosus aculeatus*, female, arrow = "bump" of elytron, 37, *Berosus aculeatus*, male , arrow = "bump" of elytron; 38 - 39, male genitalia, dorsal view, 38, *Berosus aculeatus*, arrow = slender apex of paramere, 39, *Berosus peregrinus*, arrow = wide apex of paramere.

what in females, without preapical tubercles near suture; scutellum color variable; parameres of male genitalia wider at apex (Figure 39) 8

8. Each elytron with 10 black spots; eyes at least one-half interocular distance in width; scutellum metallic-black ..... *B. pantherinus* LeConte

Each elytron with at most six black spots; eyes smaller, about one-third interocular distance in width; scutellum brown ..... *B. peregrinus* (Herbst)

Berosus aculeatus LeConte
Figures 36, 37, 38, Map 16

Berosus aculeatus LeConte, 1855. Proc. Acad. Natur. Sci. Philadelphia 7: 363.

Diagnosis. Length 3.5-4.5 mm. This is a member of a species-group of *Berosus* characterized by a single pointed tooth in the excavation of the fifth abdominal sternum. Most similar to *B. peregrinus*, this species has the elytral apices decidedly more elongated, and usually has a preapical tubercle or bump near the suture of the elytra (Figures 36 and 37) that is not found in any other *Berosus*. The male genitalia are also distinctive (Figure 38).

Notes. Members of this species were collected in both lentic and lotic habitats, often in association with mats of filamentous algae. Habitats range from flooded tire tracks, stagnant creeks, woodland detritus ponds, waterlily ponds, lake margins, and swamps, to slow-flowing streams and drainage ditches. Blacklight traps yielded many specimens. Using such traps, specimens were captured at creeks and rivers, where they probably inhabited backwater areas.

Distribution. This species occurs throughout the eastern United States, and it has been collected statewide in Mississippi with the exception of the northern Alluvial Plain (Map 16).

Specimens examined: 315 (Appendix 16).

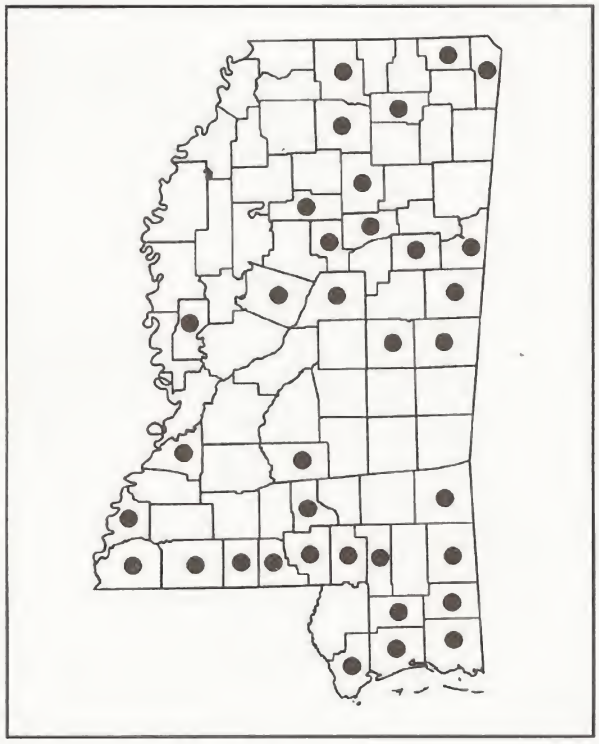
Berosus corrini Wooldridge
Map 17

Berosus corrini Wooldridge, 1964. Coleops Bull. 18: 97.

Diagnosis. Length 4.4-5.6 mm. *Berosus corrini* is recognized by the absence of distinct elytral striae, larger size, presence of two projections from the sternal emargination, and the laterally projecting, dorsal edges of the parameres of the male genitalia.

Notes. No details are known of the biology of this species.

Distribution. This species is known from North Carolina to Florida and Mississippi. Although Van Tassell (1966) recorded this species from Mississippi in her dissertation, there is no mention of a specific locality nor of the deposition of the specimens. Her distribution map for this species



Map 16. *Berosus aculeatus.*

Map 17. *Berosus corrini.*

does not show a Mississippi site, but an unmentioned locality is marked in Louisiana. A single Mississippi specimen was collected in Lamar County (Map 17).

Specimens examined: 1 (Appendix 17).

Berosus exiguus (Say)
Map 18

Hydrophilus exiguus Say, 1825. J. Acad. Natur. Sci. Philadelphia 5: 189.

Diagnosis. Length 2.0-3.5 mm. The uniquely small size, very distinctly impressed striae, testaceous head and pronotum, and indistinct, rounded projection within the abdominal emargination distinguish *B. exiguus*.

Notes. Specimens of *Berosus exiguus* are found often in standing water in association with algal mats. Habitats where specimens were collected included a small ditch, a large drainage ditch, farm ponds, woodland ponds, swamp margins, lake margins, and a small grass-filled stream, where a large series was collected. Many specimens were collected at blacklight.

Distribution. This species is known to occur from New York to Florida and west to Mississippi, and Oklahoma, and in the West Indies. Previously recorded from Horn Island, Mississippi by Richmond (1962), the species occurs throughout the state (Map 18).

Specimens examined: 626 (Appendix 18).

Berosus infuscatus LeConte
Map 19

Berosus infuscatus LeConte, 1855. Proc. Acad. Natur. Sci. Philadelphia 7: 365.

Diagnosis. Length 3.5-6.5 mm. The microreticulate pronotum of the male and pronotum and elytra of the female, slightly impressed elytral striae, and presence of two teeth in the abdominal emargination differentiate this species from other species of *Berosus* in Mississippi.

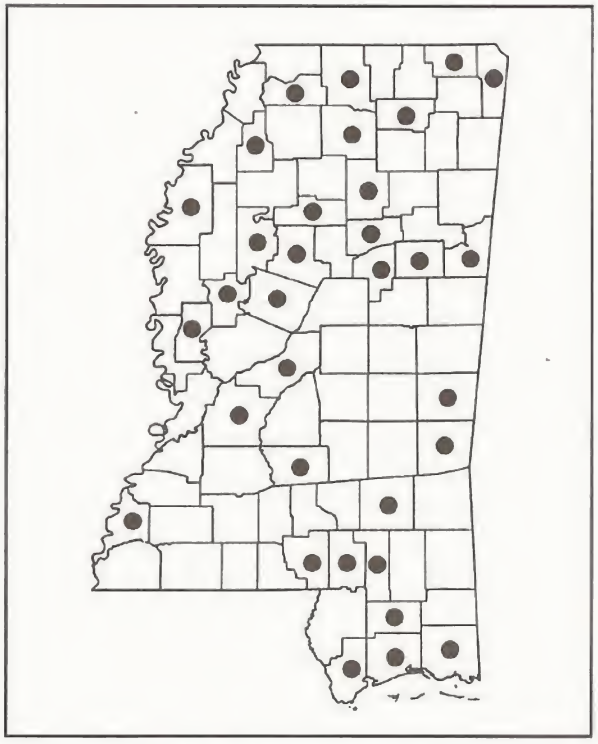
Notes. This is the most common species of *Berosus* in Mississippi. Specimens were collected from nearly every type of lentic habitat, including lakes, ponds of all types, swamps, backwater areas of streams and rivers, and brackish habitats. Individuals were attracted to light traps in large numbers.

Distribution. *Berosus infuscatus* is common throughout the southern half of the United States and the West Indies. This species was reported from Horn Island, Mississippi by Richmond (1962), and it occurs throughout the state (Map 19).

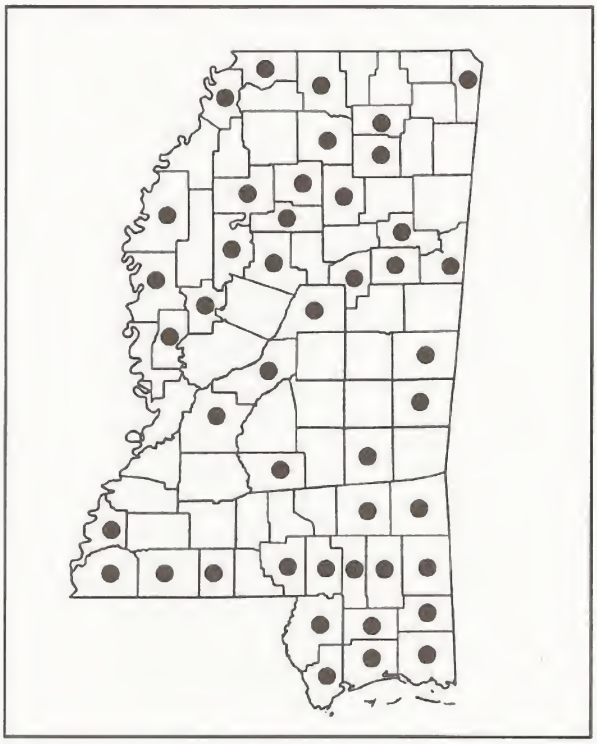
Specimens examined: 1,537 (Appendix 19).

Berosus ordinatus LeConte
Figure 33, Map 20

Berosus ordinatus LeConte, 1855. Proc. Acad. Natur. Sci. Philadelphia 7: 365.



Map 18. *Berosus exiguus.*



Map 19. *Berosus infuscatus.*

Diagnosis. Length 4.5-6.5 mm. The elytral punctures with scabrous margins and the slightly divergent and prolonged elytral apices differentiate this species from other *Berosus* occurring in Mississippi.

Notes. In Mississippi, specimens were collected from a woodland pond (in algae), large, waterlily ponds, and a backwater area of the Mississippi River. All of these specimens were collected during the months of April, May, and June.

Distribution. Although this species occurs throughout the United States east of the Mississippi River, too few specimens have been collected in Mississippi to adequately describe its distribution in the state (Map 20).

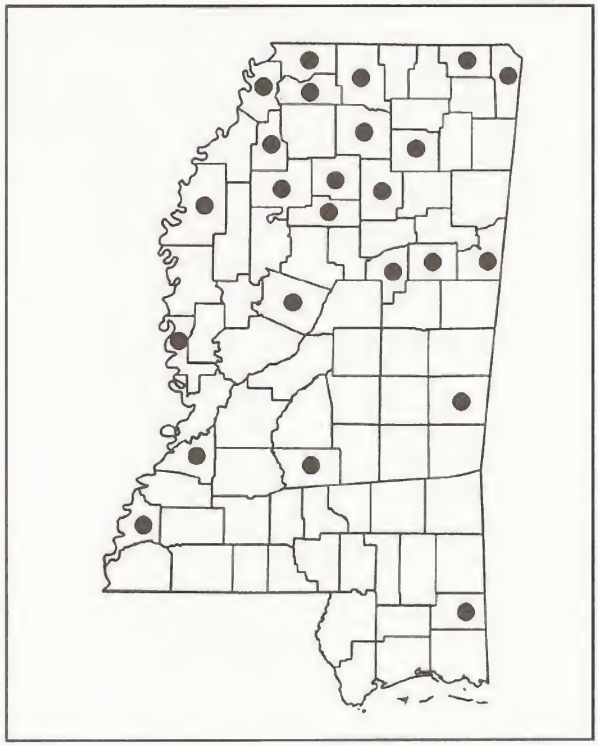
Specimens examined: 18 (Appendix 20).

Berosus pantherinus LeConte
Figure 29, Map 21

Berosus pantherinus LeConte, 1855. Proc. Acad. Natur. Sci. Philadelphia 7: 364.

Diagnosis. Length 3.5-5.0 mm. This is a very distinctive species, robust in form, and bearing 10, distinct piceous markings on each elytron. The scutellum is metallic black, as opposed to brown or testaceous in *B. exiguus, B. peregrinus,* and *B. aculeatus*, the other species with a single tooth in the abdominal emargination.

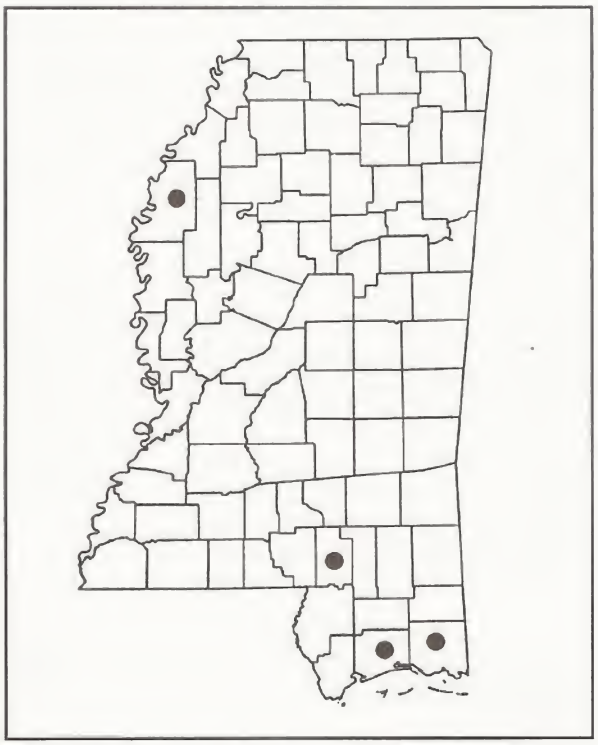
Notes. Specimens were collected from vegetation at the margin of a swamp, algal mats in a woodland detritus pond, vegetation in a variety of ponds, and in a backwater area of the Mississippi River, as well as with blacklight traps placed near various aquatic habitats.



Map 21. ***Berosus pantherinus.***

Distribution. *Berosus pantherinus* is known to occur from western Texas to Nebraska and east to West Virginia, Tennessee, and Mississippi. Specimens were collected most commonly in northern regions of the state (Map 21).

Specimens examined: 224 (Appendix 21).



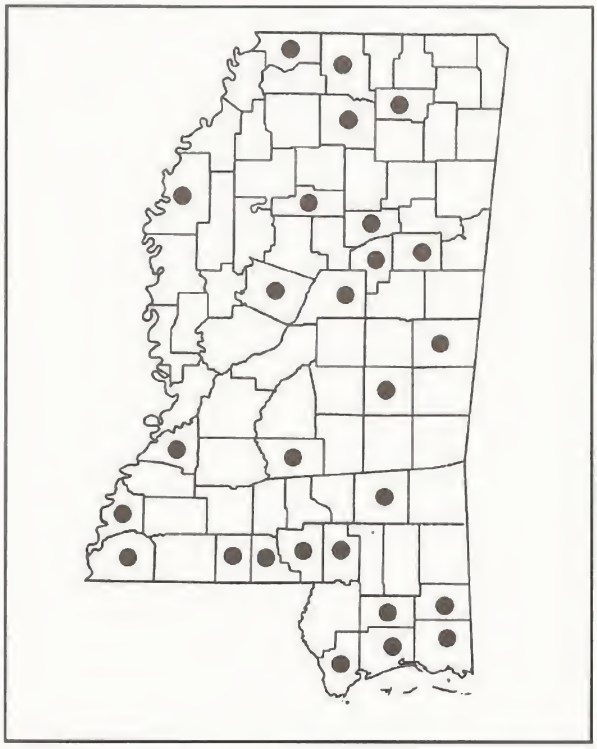
Map 20. ***Berosus ordinatus.***

Berosus peregrinus (Herbst)
Figure 39, Map 22

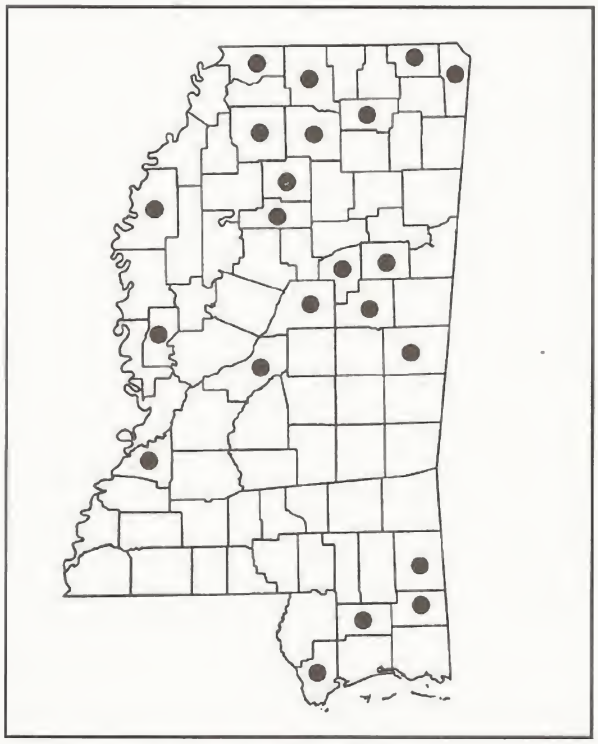
Hydrophilus peregrinus Herbst, 1797. Natursystem aller bekannten in- und auslandischen Insecten... Vol. 7: 159.

Diagnosis. Length 3.5-4.5 mm. *Berosus peregrinus* has an apically sharp tooth in the emargination of the fifth sternum, only six piceous elytral markings, and elytral apices that are only slightly prolonged at most and lacking a preapical tubercle or bump. The form of the male genitalia (Figure 39) will differentiate this species from the similar *B. aculeatus* (Figure 38).

Notes. Like *B. pantherinus*, this species can be collected in a variety of habitats. During our study, specimens were collected from a water-filled tire track, among dead grass in a stagnant creek, in *Eleocharis* and algal mats in shallow water of ponds and lakes, and at various light sources.



Map 22. *Berosus peregrinus.*



Map 23. *Berosus pugnax.*

Distribution. *Berosus peregrinus* occurs throughout the United States and is known also from northern Mexico. The species is found statewide in Mississippi (Map 22).

Specimens examined: 85 (Appendix 22).

Berosus pugnax LeConte

Figure 32, Map 23

Berosus pugnax LeConte, 1863. Smithsonian Misc. Coll. 6(167):61.

Diagnosis. Length 5.0-6.5 mm. This is the only species of *Berosus* in Mississippi with emarginate elytral apices (Figure 32).

Notes. Specimens of *Berosus pugnax* are collected often with blacklight traps and are fairly common in well-established, lentic habitats with emergent vegetation. We collected most specimens from lakes and fewer from ponds and swamps.

Distribution. *Berosus pugnax* has been reported from eastern Texas to northern Illinois and southeast to Florida. In Mississippi, the species occurs primarily in northern counties (Map 23).

Specimens examined: 225 (Appendix 23).

Berosus striatus (Say)

Figures 34, 35, Map 24

Hydrophilus striatus Say, 1825. J. Acad. Natur. Sci. Philadelphia 5: 196.

Diagnosis. Length 4.0-6.5 mm. Females of *B. striatus* can be distinguished quite easily in most cases by the presence of a small tooth at the suture near each elytral apex (Figure 34). Males of this species can be confused with those of *B. ordinatus,* but the latter has the elytra divergent in the apical fourth, forming an open angle, unlike males of *B. striatus* in which the elytra do not or only slightly diverge near the apex (Figure 35).

Notes. This species seems to prefer lentic habitats, particularly ponds; however, a few specimens were collected in light traps set near streams. Occasionally, individuals were collected from mats of filamentous algae. The variety of habitats from which specimens were collected included lakes, woodland ponds, farm ponds, waterlily ponds, and ditches.

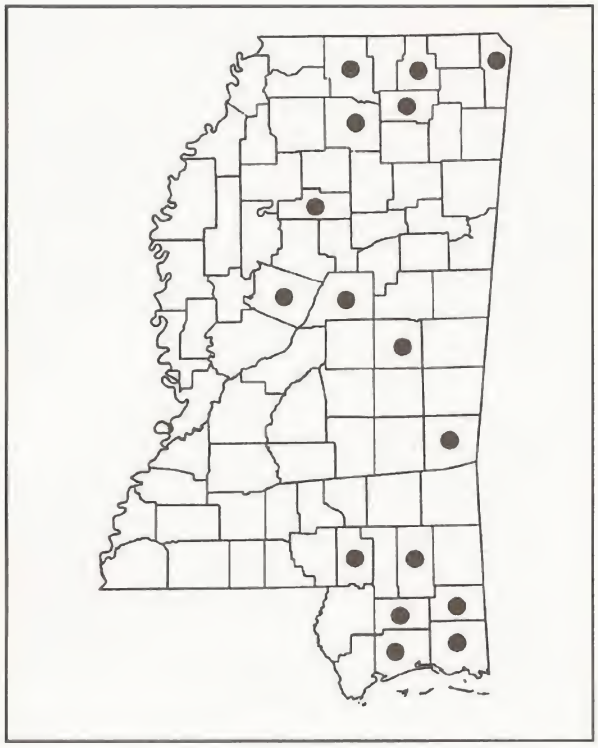
Distribution. *Berosus striatus* is distributed throughout the United States and southern Canada. This species appears to be absent in the Alluvial Plain of Mississippi, but it occurs widely in eastern regions of the state (Map 24).

Specimens examined: 130 (Appendix 24).

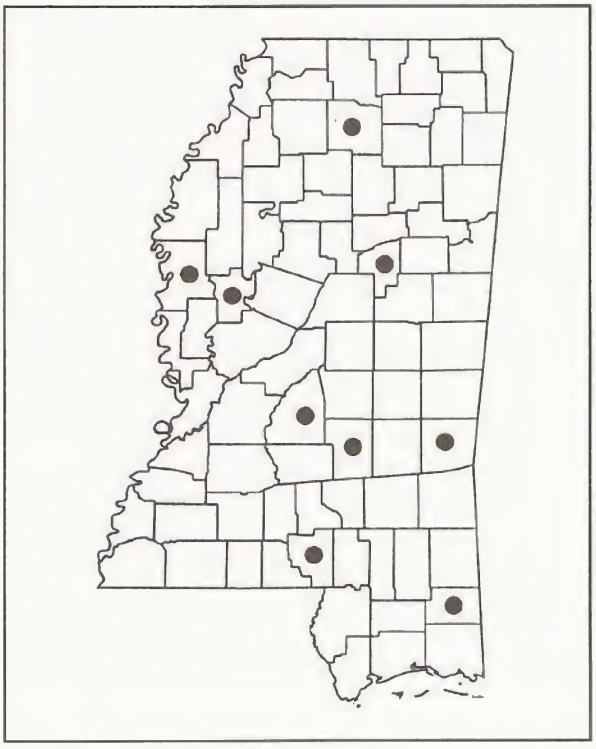
Genus *Derallus* Sharp

Derallus Sharp, 1882. Biologia Centrali-Americana, Coleoptera I,2: 77.

Diagnosis. Length 1.6-2.2 mm. The small size, dark color, highly convex form, and deeply punctate-striate elytra dis-



Map 24. *Berosus striatus.*



Map 25. *Derallus altus.*

tinguish this genus. *Derallus* might be confused with *Paracymus, Crenitulus, Anacaena,* and *Phaenonotum*, but these genera lack distinctly punctate-striate elytra.

Derallus altus (LeConte)

Figure 40, Map 25

Berosus altus LeConte, 1855. Proc. Acad. Natur. Sci. Philadelphia 7: 366.

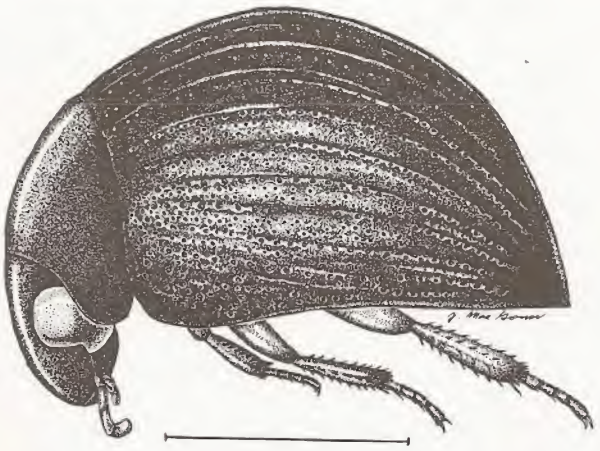


Figure 40. *Derallus altus*, scale line = 1 mm.

Diagnosis. This is the only member of this genus occurring in the United States, and the characters given in the generic diagnosis should distinguish this species.

Notes. *Derallus altus* is encountered infrequently in Mississippi. Individuals are found usually among decaying hardwood leaves and other organic debris in standing waters, most often lakes. Matta (1974) reported specimens from brackish water in North Carolina, but none was found in similar habitats in Mississippi.

Distribution. This species occurs from New Jersey to Florida and Texas and in the West Indies (Matta, 1974). The scattered distribution in Mississippi (Map 25) probably reflects the scarcity of the species.

Specimens examined: 49 (Appendix 25).

Subfamily Hydrobiinae

Genus *Laccobius* Erichson

Laccobius Erichson, 1837. Die Käfer der Mark Brandenburg 1: 202.

Diagnosis. Members of this genus are distinguished by the large metatrochanters (one-third or more the length of the metafemur), absence of any discal or sutural striae, distinctive black-speckled yellow coloration of the elytra (Figure 41), and habits.

External characteristics for separating species of this genus are lacking, and genitalic examinations are necessary to positively identify specimens. The extent of the dark preocular spot is useful in differentiating some species. The darkened pronotal pattern can be useful (Figures 42-44), especially in determining those females that can be associated with males, but it is not a definitive characteristic for routine identifications due to its variation.

Notes. B. S. Cheary revised this genus for the Nearctic region in a dissertation, and he subsequently had the work privately published in limited quantity (Cheary, 1971). The validity of Cheary's publication was uncertain, and descriptions of some of his species were credited to Malcolm (1979). Later, the validity of Cheary's (1971) publication was upheld by members of the International Commission of Zoological Nomenclature, and Cheary was given credit for describing the aforementioned species (Hardy et al., 1981).

Species of *Laccobius* are associated most often with fine sand in very shallow, flowing water, but most individuals were found in areas protected from flow in which light algal growth was evident. Presence of silt in the sand seems to reduce habitability. This agrees with information for four species in California (Perkins, 1976). Collecting in the proper habitat will undoubtedly show that species of *Laccobius* are distributed more widely in Mississippi than available records would indicate. Species of *Laccobius* occur in appropriate habitats with shallowly submerged sand, where they often burrow in the uppermost layers. They are very agile swimmers and, when exposed, will scurry quickly about in the shallows before burrowing again at the water's edge . Cheary (1971) included an excellent discussion of the biology and ecology of the genus. Life histories have been described for a species from New York (Richmond, 1920) and a species from Iowa (Wilson, 1923b). Both authors cite the species as *L. agilis*; however, present knowledge of the genus indicates that other species may have been involved.

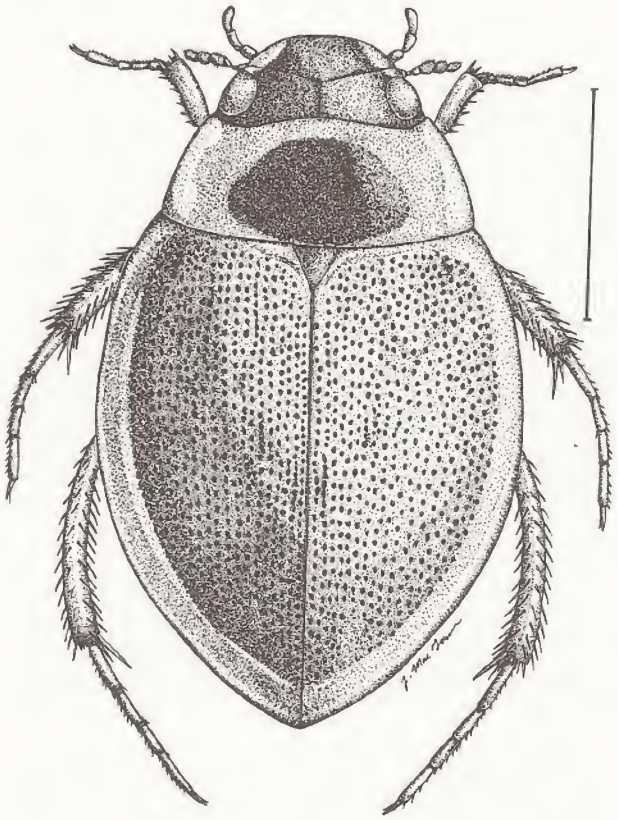


Figure 41. ***Laccobius teneralis*****, scale line = 1 mm.**

Key to Species of *Laccobius* in Mississippi

1. Parameres of male genitalia deeply invaginated laterоventrally forming dorsal and ventral arms, dorsal arm extending beyond both ventral arm and median lobe and curving spoon-like over them distally; ventral lobes shorter, not reaching apex of median lobe (Figure 45); pale preocular spot extending through epicranial suture, broadly contacting eye; pronotal maculation rounded anterolaterally, usually less than half the width of pronotum (Figure 42); length about 2.5 mm . . . . . *L. teneralis* Cheary

   Parameres not invaginated, entire; pale preocular spots confined to area anterior to epicranial suture, and not contacting eye; pronotal maculation with pointed projections anterolaterally, more than two-thirds width of pronotum (Figures 43 and 44); length 2.5-3.0 mm 2

2. Parameres rotated at apical one-third (their narrowest point when viewed dorsally) (Figure 46); pronotal maculation extended anterolaterally; preocular spots large (Figure 43) . . . . . *L. magnus* Cheary

   Parameres rotated midlength (their narrowest point when viewed dorsally) (Figure 47); pronotal maculation not extended anterolaterally; preocular spots smaller (Figure 44) . . . . . *L. minutoides* d'Orchymont

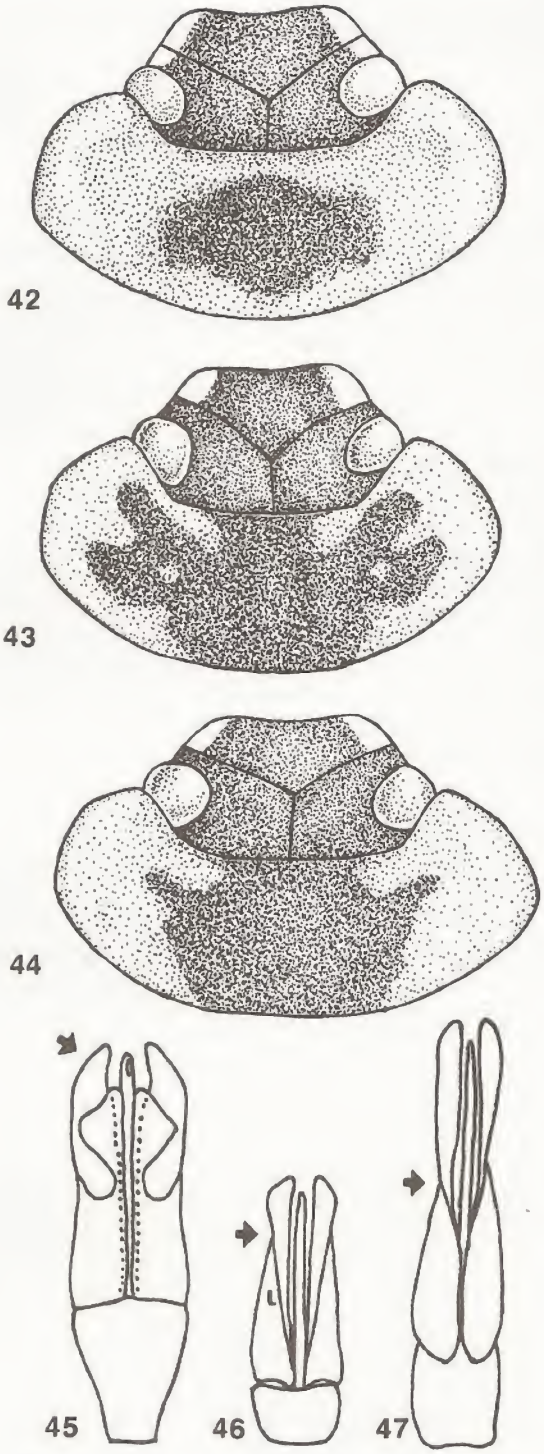
Laccobius magnus Cheary
Figures 43, 46

Laccobius magnus Cheary, 1971. The biology, ecology and systematics of the genus *Laccobius*. . . : 114.

Diagnosis. Length approximately 3.0 mm. *Laccobius magnus* has preocular spots anterior to the epicranial suture only and pronotal maculation that is extended anterolaterally (Figure 43). The aedeagal parameres are rotated at their apical third (Figure 46).

Notes. This species has not been collected in Mississippi yet; few details are known of its biology.

Distribution. *Laccobius magnus* ranges from northwestern Georgia to western Oklahoma and northward to Michigan and New York (Cheary, 1971). This species occurs in



Figures 42 - 47. Characters for identifying *Laccobius* species. 42 - 44, head and pronotum, 42, *Laccobius teneralis*, 43, *Laccobius magnus*, 44, *Laccobius minutoides*, 45 - 47, male genitalia, dorsal view, 45, *Laccobius teneralis*, arrow = dorsal arm of paramere, 46, *Laccobius magnus*, arrow = point of rotation, 47, *Laccobius minutoides*, arrow = point of rotation.

southeastern Tennessee, and it may be found eventually in the Tennessee River Hills region in northeastern Mississippi.

Laccobius minutoides d'Orchymont

Figures 44, 47, Map 26

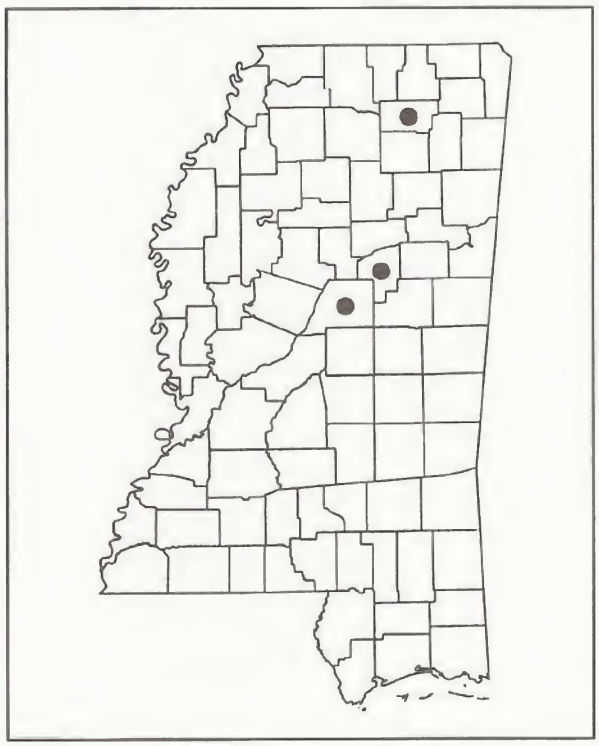
Laccobius minutoides d'Orchymont, 1942. Bull. Mus. Roy. d'Hist. Natur. Belgique 18: 10.

Diagnosis. Length 2.5-3.0 mm. In addition to the preocular pale spots that do not reach the eyes, the pronotal pattern and male genitalia can be used to distinguish this species (Figures 44 and 47). *Laccobius minutoides* and *L. magnus* have very similar pronotal maculation and male genitalia. They differ in that the parameres are rotated (offering their narrowest width when viewed dorsally or ventrally) at their midlength in *L. minutoides* (Figure 47), whereas they are rotated near the apical one-third in *L. magnus* (Figure 46).

Notes. *Laccobius minutoides* can be collected from fine sand in small to moderate-sized, slow-flowing streams and creeks. The species usually occurs at the sides of sandbars within the channels and near low-gradient sand banks in shallow water.

Distribution. Widely distributed in the eastern United States, *L. minutoides* has been collected in north- and mid-central Mississippi (Map 26).

Specimens examined: 18 (Appendix 26).



Map 26. *Laccobius minutoides*.

Laccobius teneralis Cheary
Figures 41, 42, 45, Map 27

Laccobius teneralis Cheary, 1971. The biology, ecology and systematics of the genus *Laccobius*... 107.

Diagnosis. Length 2.0-2.5 mm. Both the male genitalia and the preocular and pronotal patterns are distinctive (Figures 45 and 42).

Notes. This species was collected around sandbars and very low-gradient sand banks of slow-flowing streams having fine, clean sand bottoms. Individuals exhibited typical *Laccobius* behavior when exposed, scurrying about in the very shallow water near the land-water interface until reburying themselves among the uppermost layers of submerged sand.

Distribution. *Laccobius teneralis* occurs from Texas to Nebraska and Missouri (Cheary, 1971). The Mississippi records represent the only populations of this species known from east of the Mississippi River (Map 27).

Specimens examined: 56 (Appendix 27).

Genus *Sperchopsis* LeConte

Sperchopsis LeConte, 1862. Smithson. Misc. Coll. 3 (1861): 47.

Diagnosis. Length 6.0-7.5 mm. The single species in this genus is characterized by its reddish-brown color, serrate lateral margins of the elytra, convex body, and elongate head that is retracted partially into the pronotum.

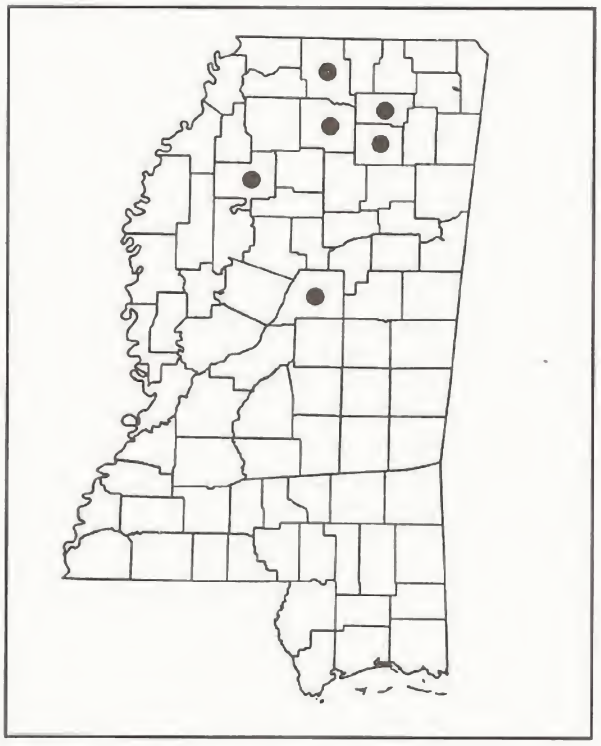
Sperchopsis tessellata (Ziegler)
Figure 48, Map 28

Spercheus tessellatus Ziegler, 1844. Proc. Acad. Natur. Sci. Philadelphia 2: 44.

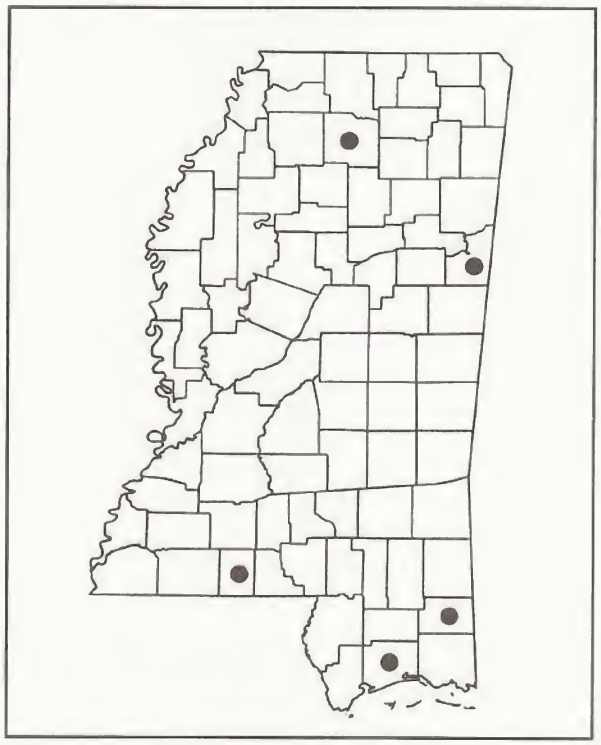
Diagnosis. *Sperchopsis tessellata* is the only species in this monotypic genus, and the characteristics presented above should distinguish the species.

Notes. This species inhabits fast-moving streams with sand and gravel bottoms where it is associated with submerged logs and leaf packs or other debris in backwater areas (Leng, 1913; Richmond, 1920; Winters, 1926; Young, 1954). Spangler (1961) discussed the present knowledge of this species; he found areas under exposed roots at the margin of streams to be the most productive for collecting these beetles.

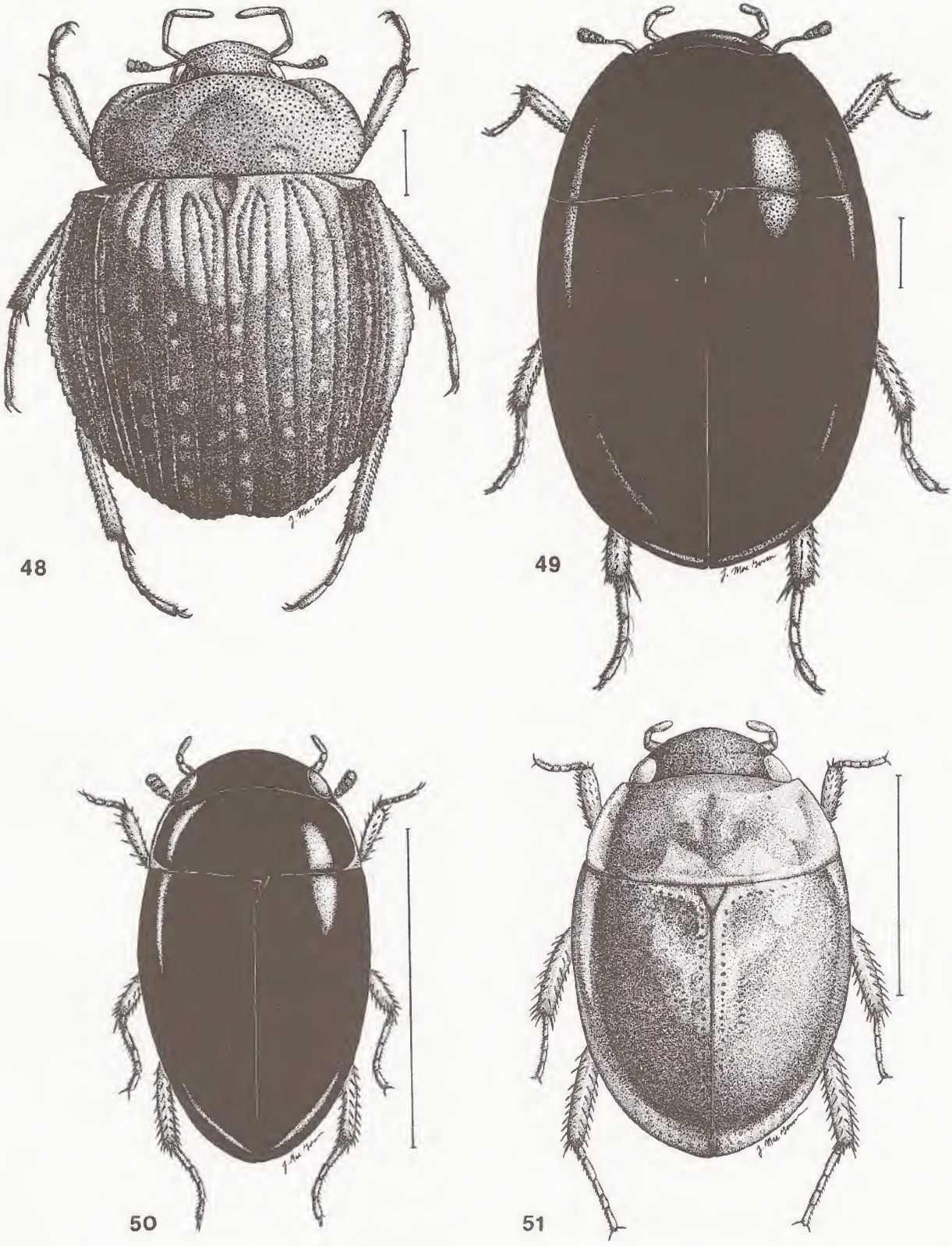
Although the appropriate habitat was found on several occasions, no specimens were collected during this study. Six specimens from Mississippi were examined, and these were collected near a small reservoir (probably from the outlet stream) (Lafayette County), a stream (Pike County), a leaf pack in a stream (Harrison County), and on a beach of Ship Island. According to Warren (1985), the distribution of this



Map 27. *Laccobius teneralis.*



Map 28. *Sperchopsis tessellata.*



Figures 48 - 51. Representatives of genera, scale line = 1 mm. **48,** *Sperchopsis tessellata*; **49,** *Hydrobius tumidus*; **50,** *Crenitulus suturalis*; **51,** *Anacaena limbata*.

species is patchy, and this probably explains the rarity of specimens in collections.

Distribution. Known to inhabit the eastern third of the United States from Canada to Florida and Mississippi. Specimens have been collected in northern and southern Mississippi (Map 28).

Specimens examined: 6 (Appendix 28).

Genus *Hydrobius* Leach

Hydrobius Leach, 1815. The Zoological Miscellany. Vol. 2: 96.

Diagnosis. The moderate size (6-9 mm), shiny and highly convex form, short maxillary palpi with the ultimate segment longer than the penultimate, fringed hind tarsi, and absence of impressed elytral striae characterize members of this genus found in southeastern North America. *Hydrobius* might be confused with large species of *Enochrus*, but *Enochrus* and other similar genera have a maxillary palpus with the ultimate segment shorter than the penultimate and a body that is less convex in form.

Notes. Three species of *Hydrobius* are known to occur in America north of Mexico. Two have northern or western distributions (Smetana, 1988), and one occurs in the southeastern United States.

Hydrobius tumidus LeConte
Figure 49, Map 29

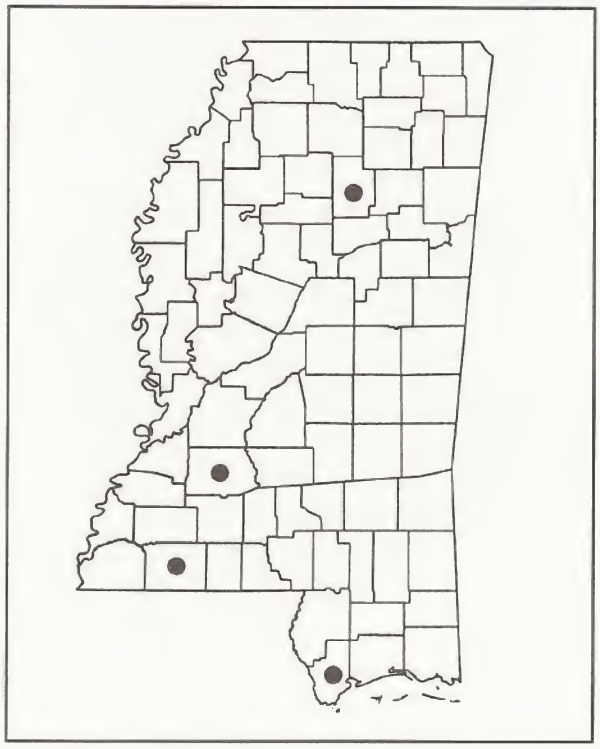
Hydrobius tumidus LeConte, 1855. Proc. Acad. Natur. Sci. Philadelphia 7: 372.

Diagnosis. Length 7-8 mm. *Hydrobius tumidus* is the only representative of the genus occurring in the southeastern states, and the characters provided in the generic diagnosis should distinguish this species.

Notes. This species has been reported to occur in woodland ponds (Young, 1954; Matta, 1974). A specimen of *H. tumidus* was collected while it was clinging to a blade of grass on the outer beach of a small coastal island in Hancock County. As no other specimens were collected during a lengthy study of the island's fauna, its occurrence there remains problematic. One specimen was collected from vegetation in a small slow-flowing stream. Four specimens were collected in blacklight traps placed near rivers.

Distribution. *Hydrobius tumidus* occurs from Maine and Indiana southward to Florida and Mississippi. Too few specimens have been collected to adequately describe its distribution within Mississippi (Map 29).

Specimens examined: 11 (Appendix 29).



Map 29. ***Hydrobius tumidus.***

Genus *Crenitulus* Winters

Crenitulus Winters, 1926. Pan-Pacific Entomol. 3: 54.

Diagnosis. The combined length of the hind tarsomeres is greater than the length of the hind tibia in *Crenitulus*, unlike the condition in the two, most similar genera, *Anacaena* and *Paracymus*. The hind femora are densely pubescent along the anterior margin in *Crenitulus*, sparsely punctate in *Paracymus*, and densely pubescent throughout in *Anacaena*. *Crenitulus* also have setose elytral punctures, unlike other genera of Hydrophilidae. These characters, in combination with its small size and nonmetallic, piceous body color, distinguishes the single species in this genus.

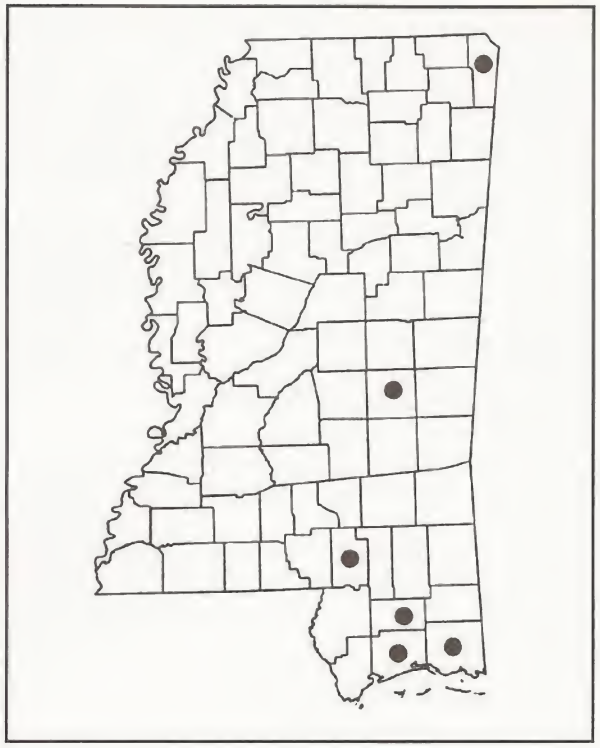
Crenitulus suturalis (LeConte)
Figure 50, Map 30

Limnebius suturalis LeConte, 1866. Proc. Acad. Natur. Sci. Philadelphia 18: 366.

Diagnosis. Length 1.6-2.2 mm. The characters presented in the generic diagnosis adequately distinguish this species.

Notes. This species was abundant in streams in Florida (Young, 1954), but in Virginia, most specimens were collected in lentic situations (Matta, 1974). In Mississippi, specimens were collected only from lentic habitats (grassy margins of woodland ponds and waterlily ponds).

Distribution. This species occurs along the Atlantic Coast from Maryland to Florida (Arnett, 1983) and westward to Mississippi. Specimens were collected in northern and



Map 30. ***Crenitulus suturalis.***

southern extremes in Mississippi. The species appears to be locally abundant (Map 30).

Specimens examined: 96 (Appendix 30).

Genus *Anacaena* Thomson

Anacaena Thomson, 1859. Scandinaviens Coleoptera. Vol. 1: 18.

Diagnosis. Although very similar in form to *Paracymus*, members of *Anacaena* differ in lacking the carinate prosternum. *Anacaena* also have the metafemora densely pubescent throughout, whereas in *Paracymus*, the base is at most sparsely setose. *Anacaena* also have a brownish color dorsally, whereas *Paracymus* are usually piceous with metallic reflections. Species of *Crenitulus* also have a brownish color, but they are more linear and have the united hind tarsomeres longer than the tibia, unlike *Anacaena* or *Paracymus*.

Notes. A single species of *Anacaena*, *A. limbata*, occurs in the southeastern United States. At least three other species have been reported in the United States, but the genus is not known well and is in need of revision. In fact, *A. limbata*, as recognized here, may be a composite of *A. limbata* and *A. lutescens* (Stephens) (Berge Henegouwen, 1986; Smetana, 1988)

Anacaena limbata (Fabricius)

Figure 51, Map 31

Hydrophilus limbatus Fabricius, 1792. Entomologica Systematica I(2): 82.

Diagnosis. Length 2.0-3.0 mm. Characters given in the generic diagnosis will distinguish this species.

Notes. No specimens of *A. limbata* were collected during this study. They were reported by Matta (1974) as occurring along the grassy margins of a stream that flowed from "Big Meadows Swamp" in the Shenandoah Mountains in Virginia. Richmond (1920) described the egg and larva and discussed the life history of this species (as *A. infuscata*).

Distribution. This species occurs across Canada (Smetana, 1988), south to California and New Mexico (Arnett, 1983), and in Arkansas and Mississippi. Richmond (1962) recorded *A. limbata* from Horn Island, Jackson County (Map 31; Appendix 31).

Genus *Paracymus* Thomson

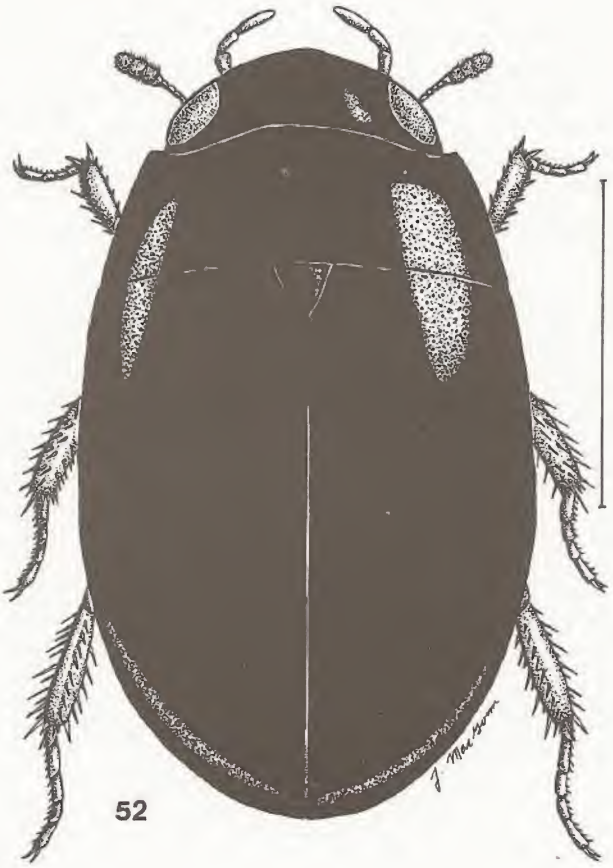
Paracymus Thomson, 1867. Skandinaviens Coleoptera 9: 119.

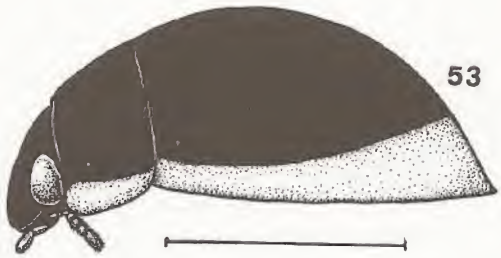
Diagnosis. Most likely to be confused with *Crenitulus*, specimens of *Paracymus* have bodies that are piceous-metallic and more globose, and hind tarsi that are shorter than the

Map 31. ***Anacaena limbata*** **(from Richmond, 1962).**

tibia (Figures 52 and 53). *Crenitulus* are brownish without a metallic sheen, are more linear, and have hind tarsi that are longer than the tibia. Species of *Anacaena* are also quite similar, but they have a noncarinate prosternum (longitudinally carinate in *Paracymus*).

One of the important characters for separating species of *Paracymus* is the development of the longitudinal mesosternal crest. In some species, the crest is well-developed and bisects the transverse pyramidal ridge of the mesosternum, obscuring the apex of this ridge in lateral view. The outer edge of the crest in these species is nearly parallel to the body axis (Figure 54). In other species, the crest curves mesad anteriorly and ends prior to reaching the transverse ridge, which is therefore acute in profile (Figure 55). The location of these structures warrants the effort to angle the head upward when mounting fresh specimens, thus providing a better view of the area.





Figures 52 - 53. Representatives of genera, scale line = 1 mm. 52, *Paracymus confusus*; 53, *Paracymus lodingi*, lateral view.

The small size and great external similarity of most *Paracymus* necessitate the use of the male genitalia for diagnostic purposes. Many individuals will exert the genitalia, at least partially, when killed in alcohol.

Sexing specimens is possible for some species. Males of the species with eight or nine antennomeres have the distal protarsomere(s) thickened in lateral view and the ultimate tarsomere armed ventrally with two, preapical, spiniform projections. In species with seven antennomeres and females of all species, the protarsomeres are linear and not armed ventrally.

Notes. This genus was revised for the Nearctic region by Wooldridge (1966), who recognized 14 species. An additional species has been described by Wooldridge (1978).

These very small beetles are difficult to collect for several reasons. Their size allows them to pass through the mesh of standard aquatic net bags, and many specimens may be lost while rinsing a sample. Individuals freely crawl through such nets, after which they drop or take flight. Those individuals not escaping often remain inactive in the sample mass during sorting, and are overlooked easily. Observations of *Paracymus* coming to light traps indicated that the beetles typically come to rest one foot or more from the light source. Thus, blacklight traps with small funnels may yield few specimens.

The only consistently productive method for capturing individuals of *Paracymus* was treading. Sites with living plants having thin blades, culms, or stems, e.g., *Eleocharis* sp. or *Chara* sp., were the most productive for finding *Paracymus;* however, many individuals were captured from decaying submerged grass and other vegetation. *Paracymus* may feed on the algae that grow on these plants.

Key to Species of *Paracymus* in Mississippi
(modified from Wooldridge, 1966, 1978)

1. Longitudinal mesosternal crest continuous, almost parallel to body plane from its origin between mesocoxae to its bisection of transverse mesosternal ridge, usually obscuring acute angle of ridge in lateral view (Figure 54); seven antennomeres 2
   Longitudinal mesosternal crest poorly developed, not reaching transverse ridge, not parallel to body plane, apex of transverse ridge acute in lateral view (Figure 55); number of antennomeres variable 4
2. Pronotum and elytra with sharply defined, pale border (Figure 53); genitalia as in Figure 56 . . . . . .*P. lodingi* (Fall)

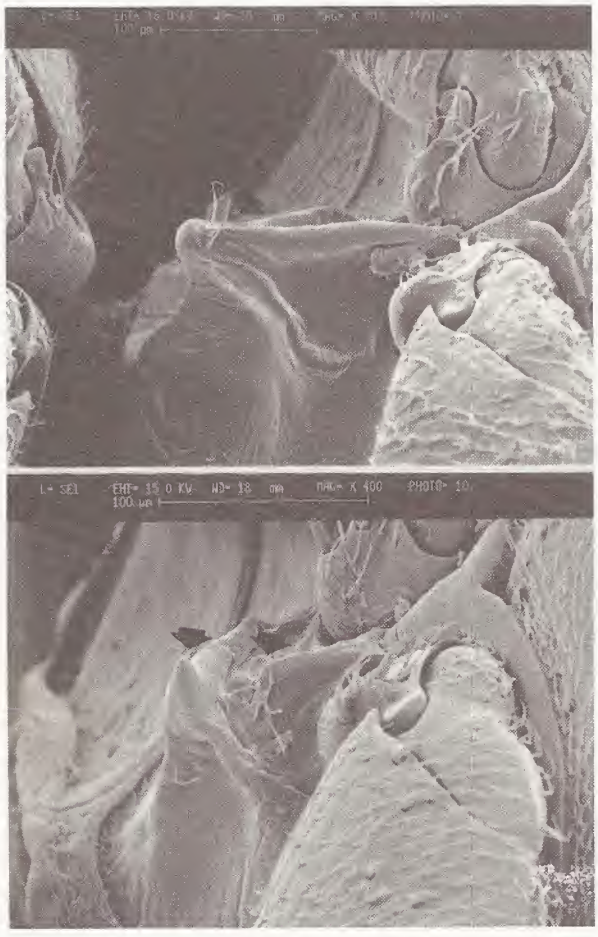
Pronotum and elytra without sharply defined border, although suffusedly paler laterally in many specimens; genitalia as in Figure 57 3

3. Ventral surfaces and legs black; mesofemora pubescent in basal two-thirds; metafemora smooth and polished, with scattered minute punctures, but lacking strigose lines (although two or three vague lines are indicated near knee in holotype) ..... *P. seclusus* Wooldridge

   Ventral surfaces and especially legs reddish or testaceous; mesofemora pubescent on basal half; metafemora longitudinally strigose (Figure 63) ..... *P. nanus* (Fall)

4. Elytra densely microreticulate; seven antennomeres; body form very convex, hemispherical in lateral view; genitalia as in Figure 58 ..... *P. reductus* (Fall)

   Elytra smooth and shining, not microreticulate; eight antennomeres; body form less convex, elytra tapering slightly toward their apices 5



Figures 54 - 55. Mesosternal crest of *Paracymus* species. 54, *Paracymus nanus*, arrow = intersection of longitudinal crest and transverse ridge, 55, *Paracymus subcupreus*, left arrow = acute apex of transverse ridge, right arrow = decline of longitudinal crest.

5. Protarsal claws of males equally thickened in distal view (Figure 59); median lobe of male genitalia nearly as long as parameres and relatively slender (Figure 61); length usually greater than 2.2 mm ..... *P. subcupreus* (Say)

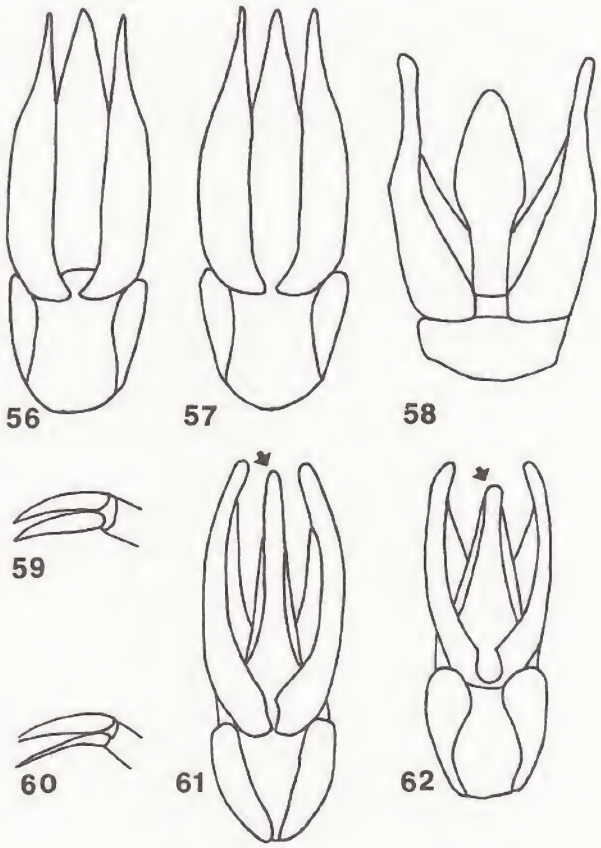
   Protarsal claws of males dissimilar, posterior claw obviously less robust than anterior claw in distal view (Figure 60); median lobe of male genitalia (Figure 62) obviously shorter than parameres and more robust in comparison to that of *P. subcupreus;* length usually less than 2.2 mm ..... *P. confusus* Wooldridge

Paracymus confusus Wooldridge

Figures 52, 60, 62, Map 32

Paracymus confusus Wooldridge, 1966. J. Kansas Entomol. Soc. 39: 719.

Diagnosis. Length 1.9-2.1 mm. *Paracymus confusus* can be



Figures 56 - 62. Characters for identifying *Paracymus* species. 56 - 58, male genitalia, dorsal view, 56, *Paracymus lodingi*, 57, *Paracymus seclusus*, 58, *Paracymus reductus*, 59 - 60, protarsal claws, male, 59, *Paracymus subcupreus*, 60, *Paracymus confusus*; 61 - 62, male genitalia, dorsal view; 61, *Paracymus subcupreus*, arrow = longer median lobe, 62, *Paracymus confusus*, arrow = shorter median lobe.

separated from all other species in Mississippi, except *P. subcupreus*, by the incomplete mesosternal crest and shining elytra. The thickened anterior protarsal claw of male *P. confusus* (distal view) (Figure 60), as well as the shape of the aedeagus (Figure 62), differentiates this species from *P. subcupreus*. The pronotal punctation also differentiates the two species; however, this character is not constant. In *P. subcupreus*, the pronotum ordinarily is uniformly punctate. The pronotum usually is confusedly punctate in *P. confusus*, often with small ovals or larger areas that are impunctate and occasionally with some punctures coalescing. The pronotal characters are grossly evident on some specimens, but they are not on others. They do seem to hold true more often for females than males, but in general, females of these two species cannot be separated reliably.

Notes. One of the most common members of the genus in Mississippi, *P. confusus* appears to prefer aquatic habitats with at least some flow, being found commonly in flooded ditches and patches of vegetation in slow-flowing streams. Specimens also can be collected among thin-stemmed vegetation in lentic habitats.

Distribution. This species occurs throughout the United States, Mexico, and the West Indies (Wooldridge, 1966), and it occurs throughout Mississippi (Map 32).

Specimens examined: 44 (Appendix 32).

Paracymus lodingi (Fall)

Figures 53, 56, Map 33

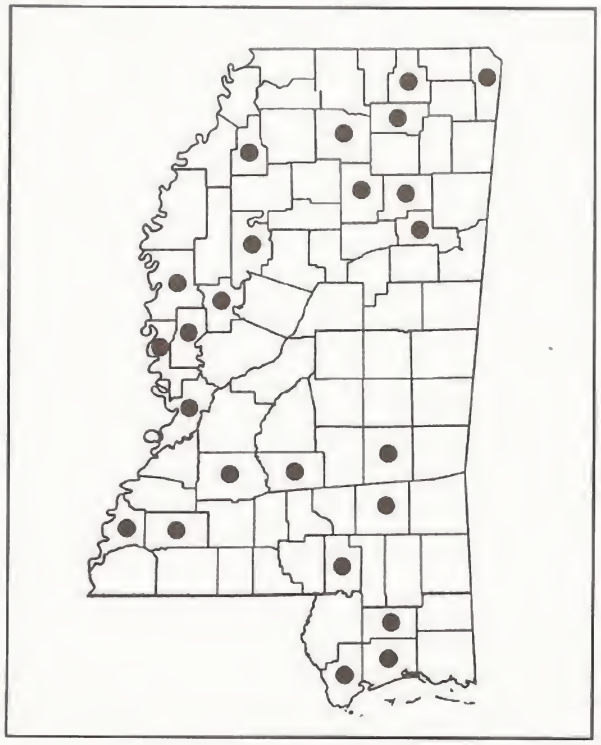
Creniphilus lodingi Fall, 1910. Trans. Amer. Entomol. Soc. 36: 98.

Diagnosis. Length 2.2-2.6 mm. *Paracymus lodingi* has a complete mesosternal crest, as in *P. nanus* and *P. seclusus*, but it is separable from those species by having a distinct pale border along the length of the elytra and pronotum (Figure 53). In *P. nanus* and *P. seclusus*, the outer border of the elytra is lightened only slightly or not at all. Only one other species of *Paracymus* in the southeast, *P. degener* (Horn), known only from Florida, normally has a distinct pale elytral border, however, it has microreticulate elytra.

Notes. This species is known to occur in brackish habitats (Young, 1954). Specimens were collected from a brackish pond on Point Clear Island, Hancock County during this study, but most specimens were collected with blacklight traps in the tidal marsh area around that island.

Distribution. The known range of this species extends along coastal Mississippi, Alabama, Florida, and into the Bahamas. It has been collected in only two counties in Mississippi (Map 33).

Specimens examined: 127 (Appendix 33).



Map 32. ***Paracymus confusus.***

Map 33. ***Paracymus lodingi.***

Paracymus nanus (Fall)
Figures 54, 63, Map 34

Creniphilus ellipsus var. *nanus* Fall, 1910. Trans. Amer. Entomol. Soc. 36: 99.

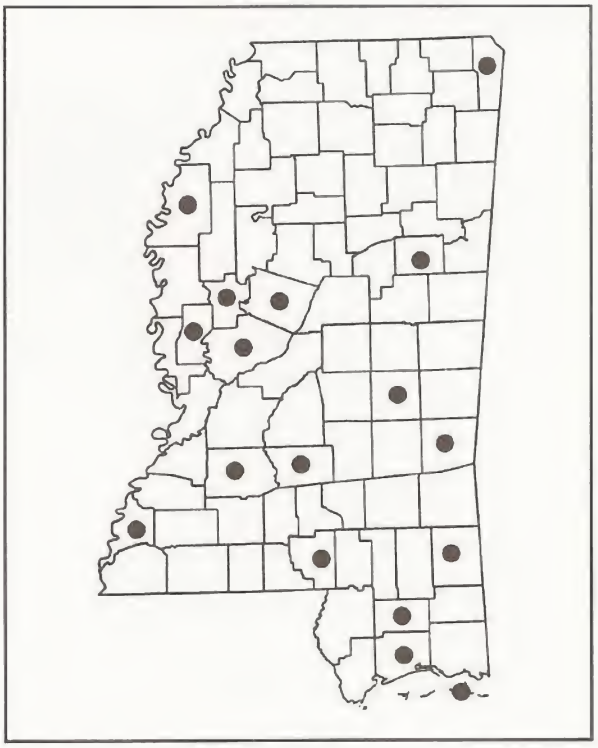
Diagnosis. Length 1.5-1.8 mm. *Paracymus nanus* is similar to *P. seclusus* in having a well-developed mesosternal crest and lacking both microreticulation and a distinct pale border on the elytra. The two species can be separated by differences in the metafemora, which is noticeably strigate in *Paracymus nanus* (Figure 63) and smooth with a few scattered punctures in *P. seclusus*. Also in *P. nanus*, the pubescence on the base of the mesofemora is reduced, covering a triangular area that extends about one-half or less the femoral length, whereas in *P. seclusus*, the mesofemora is pubescent throughout its basal two-thirds (see the discussion under *P. seclusus*). The genitalia of the two species are very similar (Figure 57). The only other species having a well-developed longitudinal mesosternal crest is *P. lodingi*, which has a distinct pale border laterally on the elytra and pronotum.

Notes. Young (1954) found this species in aquatic habitats in flatwoods of northern Florida, and he also reported that specimens had been collected beneath water hyacinth in south-central Florida. The preferred habitat of this species appears to be sandy lake margins with emergent, thin-bladed vegetation (especially *Eleocharis*), but a few specimens were collected from similar vegetation in mud-bottomed lakes. In addition, single specimens were collected from a flooded ditch, a swamp margin, a large bayou, and a farm pond, and from a light trap near the Mississippi River.

Distribution. *Paracymus nanus* is known from Louisiana, Mississippi, Florida, and the Bahamas (Wooldridge, 1966). Originally reported from Horn Island by Richmond (1962), this species is known now to occur throughout Mississippi (Map 34).

Specimens examined: 35 (Appendix 34).

Figure 63. Metafemora of *Paracymus nanus*, ventral surface, arrows = areas with strigose lines.



Map 34. *Paracymus nanus*.

Paracymus reductus (Fall)
Figure 58, Map 35

Creniphilus reductus Fall, 1910. Trans. Amer. Entomol. Soc. 36: 99.

Diagnosis. Length 1.6-1.8 mm. This is the only species in Mississippi that has both an incomplete mesosternal lamina and microreticulate elytra. The male genitalia are distinctive (Figure 58).

Notes. Few details concerning the biology of this species have been reported. The single specimen from Mississippi was collected in a blacklight trap in a tidal marsh in coastal Hancock County.

Distribution. This species previously was known only from peninsular Florida, but it is recorded here from coastal Mississippi (Map 35).

Specimens examined: 1 (Appendix 35).

Paracymus seclusus Wooldridge
Figure 57, Map 36

Paracymus seclusus Wooldridge, 1978. J. Kansas Entomol. Soc. 39: 401.

Diagnosis. Length 1.8-2.2 mm. *Paracymus seclusus* has a well-developed mesosternal crest that extends forward past the transverse mesosternal ridge. It differs from *P. lodingi*

Map 35. *Paracymus reductus.*

in lacking the defined pale border of the pronotum and elytra. *Paracymus seclusus* differs from *P. nanus*, the other species in Mississippi with a well-developed mesosternal crest, in two important features: sculpturing of the metafemora and extent of mesofemoral pubescence. In *P. seclusus,* the mesofemora are pubescent in the basal two-thirds, and the metafemora are smooth, polished, and weakly punctate, and lack longitudinal strigate lines (although the holotype has a couple of vague, short lines near the knee). In *P. nanus,* the mesofemora has a pubescent triangle extending half its length, and the metafemora are obviously strigate in the anterior half (Figure 63) and have more distinctly impressed punctures. The genitalia of *P. seclusus* (Figure 57) and *P. nanus* are very similar.

Notes. Only three specimens are known, the holotype and two paratypes, all of which were collected in a light trap in Harrison County, Mississippi, 4 October 1968.

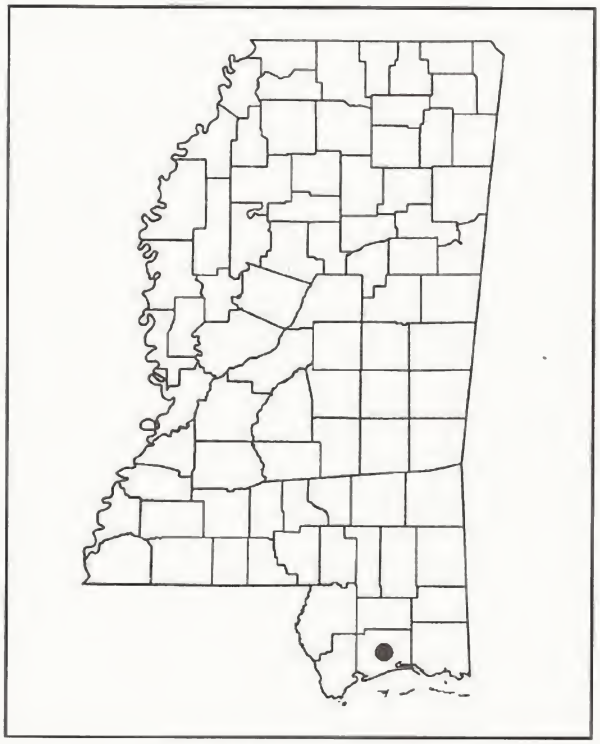
Distribution. This species is known only from the type series from an unknown locality in Harrison County (Map 36).

Specimens examined: 2 (Appendix 36).

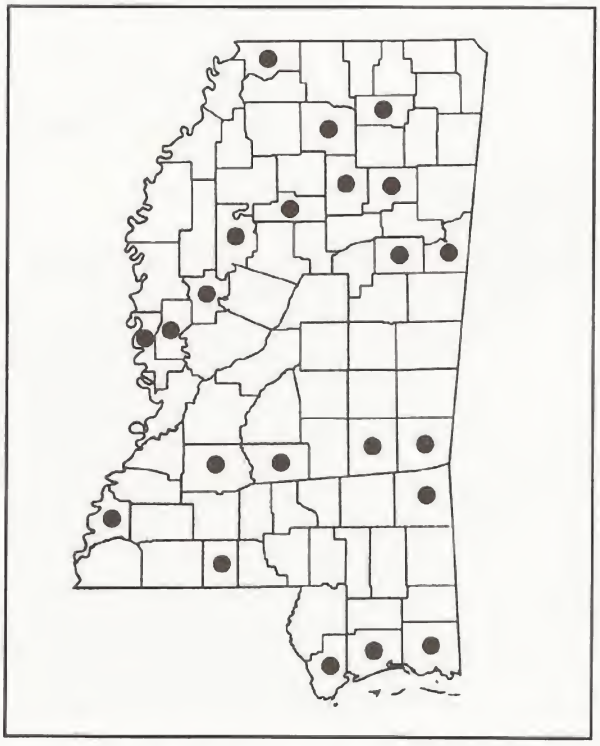
Paracymus subcupreus (Say)

Figures 55, 59, 61, Map 37

Hydrobius subcupreus Say, 1825. J. Acad. Natur. Hist. Philadelphia 5: 189.



Map 36. *Paracymus seclusus.*



Map 37. *Paracymus subcupreus.*

Diagnosis. Length 2.3-2.6 mm. The incomplete mesosternal crest and shining elytra differentiates *Paracymus subcupreus* from other Mississippi members of the genus, except the very similar *P. confusus* (see diagnosis of that species).

Notes. *Paracymus subcupreus* appears to prefer lentic habitats. Specimens were collected most often from *Eleocharis* and similar vegetation in shallow waters of ponds and lakes. Richmond (1920) described the immature stages of what was probably *P. subcupreus* (Brigham, 1982). Richmond's (1962) record of *P. subcupreus* from Horn Island, Mississippi, might have pertained to either this species or *P. confusus*.

Distribution. This species ranges throughout the United States east of the Rocky Mountains (Wooldridge, 1966), and it occurs throughout Mississippi (Map 37).

Specimens examined: 56 (Appendix 37).

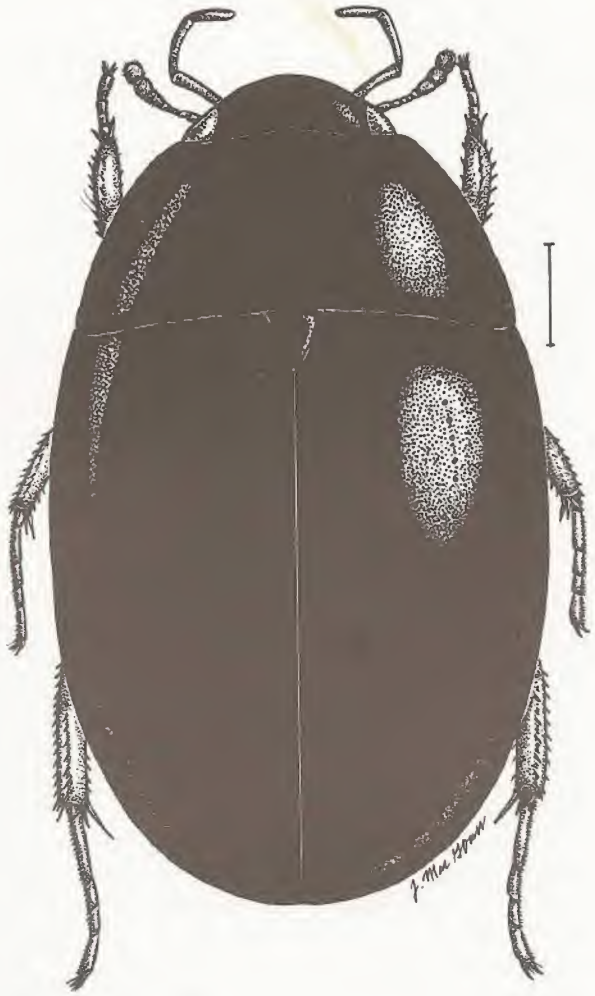


Figure 64. *Enochrus consors*, scale line = 1 mm.

Genus *Enochrus* Thomson

Enochrus Thomson, 1859. Skandinaviens Coleoptera. Vol 1: 18.

Diagnosis. *Enochrus* are similar in form to many other genera of Hydrophilidae and are most similar to *Cymbiodyta*. *Enochrus* are distinguished by having the maxillary palpi (when extended forward) with a mesally convex, pseudobasal (second) segment (Figure 64), a longitudinal mesosternal crest, and all tarsi five-segmented. Sexual dimorphism is not apparent within this genus.

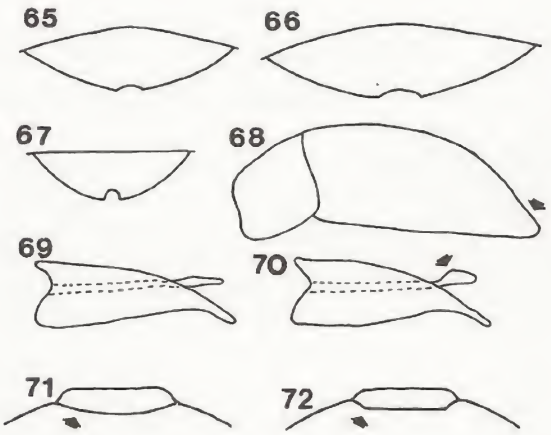
Identification at the specific level is based upon a number of characters, of which the shape of the longitudinal, mesosternal crest is the primary. This makes the proper mounting of specimens very important, especially for smaller ones that must be glued to a card point. If the crest is covered, the specimen almost certainly will need to be remounted before it can be identified.

Notes. Gundersen (1978) revised this group for the Nearctic region and recognized 24 species, of which 12 are known to occur in Mississippi. Prior to this revision, Gundersen (1977) described six new species and designated lectotypes and paralectotypes for several others.

Members of this genus are abundant in shallow, densely vegetated habitats in Mississippi, and several species typically will occur together. Common species are attracted often to lights in large quantities; and in these instances, those less common may be overlooked easily because of the great similarity of some species.

Key to Species of *Enochrus* in Mississippi
(modified from Gundersen, 1978)

1. Apex of fifth abdominal sternite fringed with stout, golden bristles and usually emarginate (sometimes shallowly) (Figures 65, 66, 67); length 2.25-8.2 mm . . 3
   Apex of fifth abdominal sternite lacking both golden bristles and emargination; length 3.0-6.6 mm 2
2. Elytral apices somewhat extended and tapered posteriorly in lateral view (Figure 68); body uniformly pale, testaceous to light brown; length 3.0-4.0 mm . . . . . *E. reflexipennis* (Zimmermann)
   Elytral apices uniformly convex in lateral view (typical for genus); body usually black to dark brown, occasionally pale and with only center of head and thorax darkened; length 4.0-6.6 mm . . *E. hamiltoni* (Horn)
3. Dorsal coloration black or piceous, sides of thorax and corners of clypeus pale in some species; length usually more than 4.5 mm, except *E. perplexus* (4.2-6.0 mm) 4
   Dorsal coloration pale, yellow to brown, center of thorax occasionally darkened; length less than 4.5 mm 8
4. Mesosternal crest undercut posteriorly to form projecting lobe in lateral view (Figure 73); length 4.9-7.5 mm



Figures 65 - 72. Characters for identifying *Enochrus* species. 65 - 67, emargination of fifth sternite, 65, *Enochrus perplexus*, 66, *Enochrus interruptus*, 67, *Enochrus blatchleyi*, 68, prothorax and elytra of *Enochrus reflexipennis*, lateral view, arrow = " reflexed" portion of elytron; 69 - 70, male genitalia, lateral view, 69, *Enochrus perplexus*, 70, *Enochrus interruptus*, arrow = enlarged apex of median lobe; 71 - 72, clypeus and labrum, 71, *Enochrus consortus*, arrow = smoothly rounded emargination, 72, *Enochrus consors*, arrow = angle of emargination.

. . . . . *E. cinctus* (Say)

Mesosternal crest not undercut; length variable 5

5. Apical notch of last abdominal sternite very shallow, barely discernible (Figure 65); length 4.2-6.0 mm; lateral margins of pronotum, elytra, and corners of clypeus pale; male genitalia as in Figure 69 . . . . . *E. perplexus* (LeConte)

Apical notch of last abdominal segment distinct (Figure 66); pronotal, elytral and clypeal coloration variable; length more than 4.5 mm 6

6. Length 6.0 mm or less; margins of pronotum, elytra, and corners of clypeus pale; mesosternal crest generally bare, with a few setae near apex (Figure 74); median lobe of male genitalia exposed and enlarged apically in lateral view (Figure 70) . . . . . *E. interruptus* Gundersen

Length more than 6.0 mm; color variable; mesosternal crest generally with lateral facies setose; median lobe of male genitalia not or only slightly enlarged apically, often not visible in lateral view 7

Margins of thorax and elytra pale, brown to yellow; palpi brown to yellow; clypeal emargination smoothly rounded (Figure 71); length 6.0-7.6 mm . . . . . *E. consortus* Green

Margins of thorax and elytra black; palpi nearly totally black; clypeal emargination straight centrally (Figure 72); length 6.8-8.2 mm . . . . . *E. consors* (LeConte)

8. Mesosternal crest small and evenly rounded (Figure 75) 9

Mesosternal crest prominent and subrectangular or triangular in lateral view, with apical angle or tooth 10

9. Length 2.25-2.7 mm; epipleura normally pale; clypeus normally bicolored, piceous over central half, testaceous laterally . . . . . *E. sublongus* (Fall)

Length 2.5-3.5 mm (rarely less than 2.9 mm); epipleura normally dark; clypeus never bicolored with piceous center, although center may be clouded . . . . . *E. ochraceus* (Melsheimer)

10. Prosternum without distinct median carina (may be smoothly raised); abdominal emargination very wide and deep, easily discernible; length 3.0-4.4 mm . . . . . *E. blatchleyi* (Fall) (Teneral specimens of other species will also key to this point; *E. perplexus* has an extremely shallow abdominal notch; for specimens larger than 4.4 mm, see preceding couplet 3 and following diagnosis of *E. blatchleyi*)

Prosternum distinctly carinate medially; abdominal emargination not as wide and deep, not easily discernible; length 3.4-4.2 mm 11

11. Mesosternal crest obtusely angled anteriorly, posterior edge broadly expanded to form slight "hump" in lateral view (Figure 76); prosternum paler than metasternum; length 3.7-4.2 mm . . . . . *E. sayi* Gundersen

Mesosternal crest forming an acute angle anteriorly (Figure 77), posterior edge without "hump" in lateral view; prosternum and metasternum dark 12

12. Clypeal center darkened; mesosternal crest with approximately right angle anteriorly; occurs throughout Mississippi . . . . . *E. pygmaeus nebulosus* (Say)

Clypeus entirely light; mesosternal crest with anterior angle more acute; usually coastal and adjacent counties . . . . . *E. pygmaeus pygmaeus* (Fabricius)

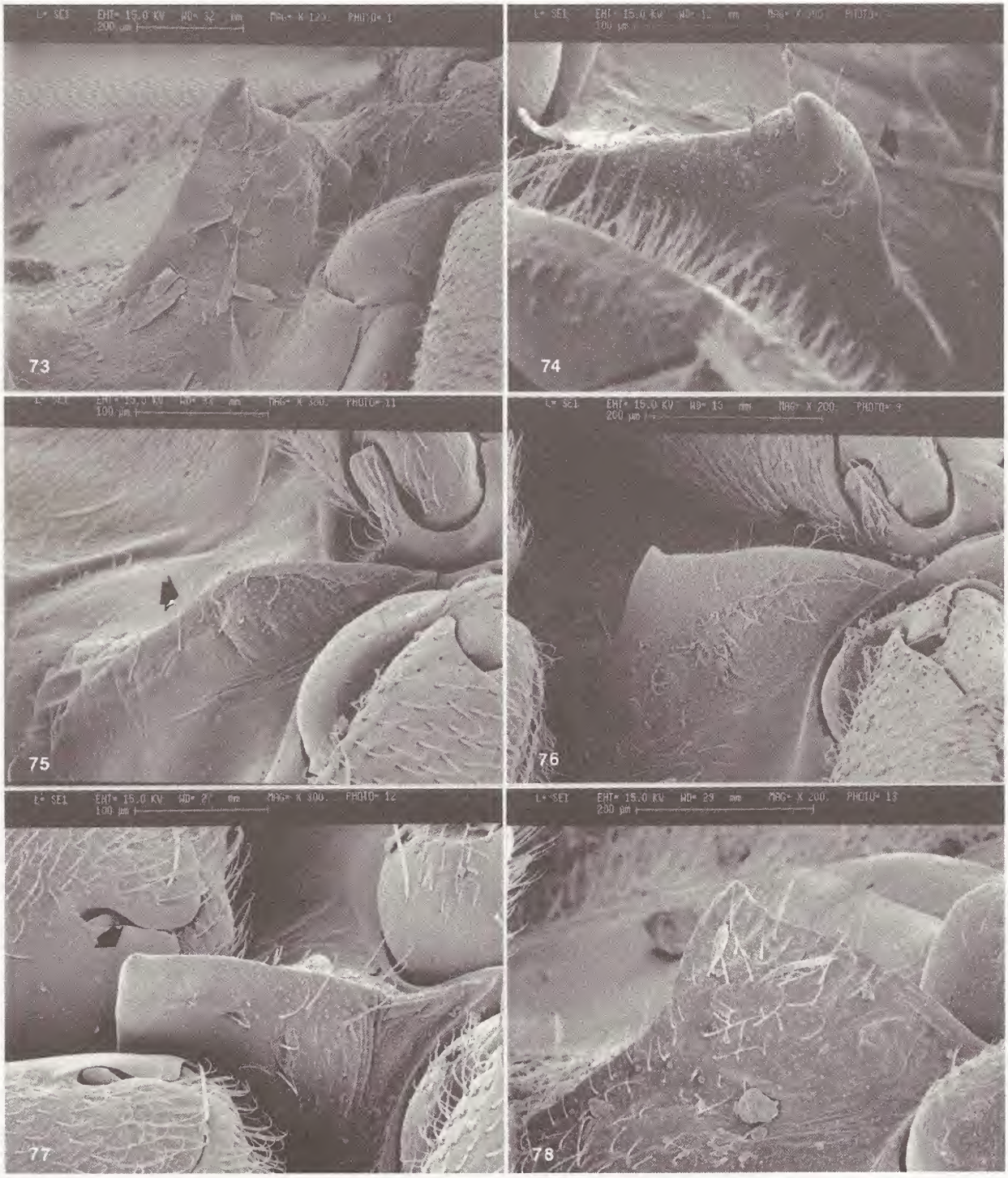
Enochrus blatchleyi (Fall)

Figure 67, Map 38

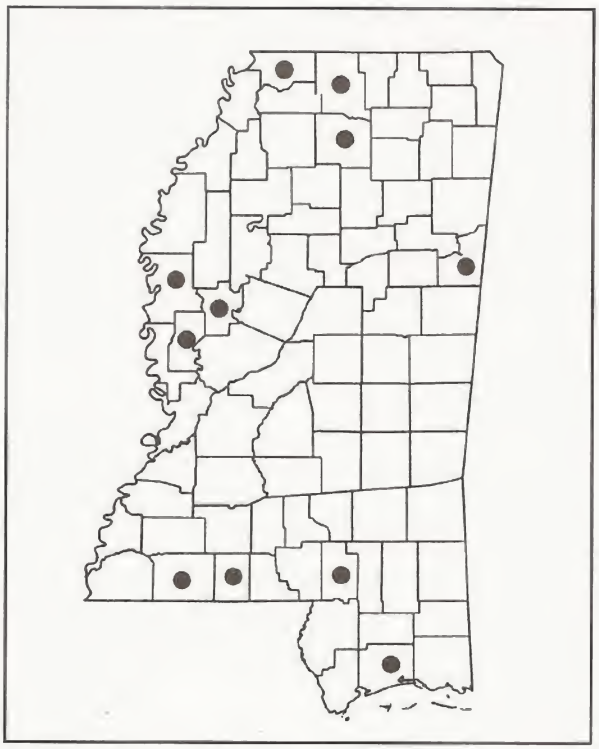
Philhydrus blatchleyi Fall, 1924. J. New York Entomol. Soc. 32: 85.

Diagnosis. Length 3.0-4.4 mm. Although similar in size and color to *E. ochraceus, E. sayi,* and *E. pygmaeus, E. blatchleyi* can be differentiated by its more concave emargination (Figure 67) of the fifth sternum, and the absence of a prosternal carina.

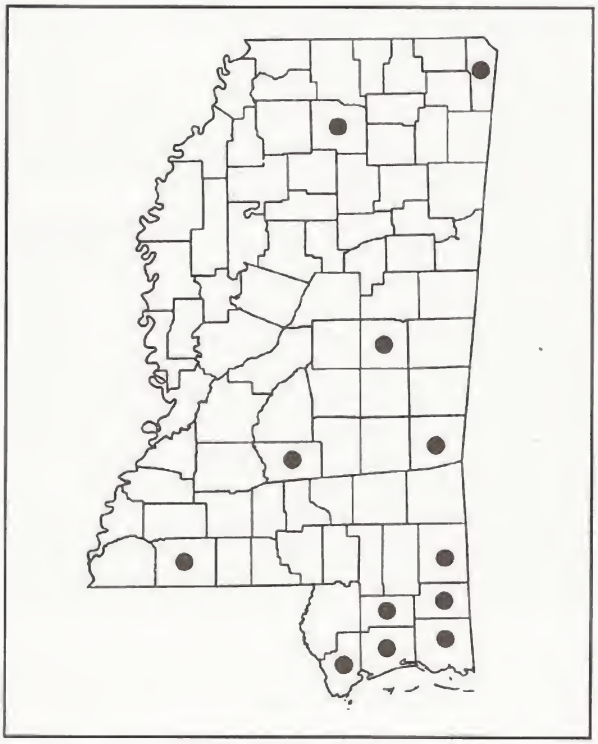
Pale or teneral specimens of other species may key to *E. blatchleyi* (couplet 3), so the key characters must be evaluated carefully. *Enochrus cinctus* and *E. interruptus* are about the same size as *E. blatchleyi*, but *E. cinctus* has a mesosternal crest that is undercut posteriorly (Figure 73), and *E. interruptus* has a relatively shallow abdominal emargination (Figure 66). *Enochrus consors* and *E. consortus* are usually too large to be mistaken for *E. blatchleyi*.



Figures 73 - 78. Mesosternal crest of *Enochrus* species. 73, *Enochrus cinctus*, arrow = posterior projection, 74, *Enochrus interruptus*, arrow = setae near apex, 75, *Enochrus ochraceus* (also characteristic of *E. sublongus*), arrow = anterior edge, 76, *Enochrus sayi*, arrow = "hump" parallel to body plane, 77, *Enochrus pygmaeus nebulosus*, arrow = anterior angle, 78, *Enochrus hamiltoni*.



Map 38. *Enochrus blatchleyi.*



Map 39. *Enochrus cinctus.*

Notes. Most specimens from Mississippi were collected from flooded, grassy ditches with the remainder collected from vegetated pond margins and a small grassy stream; individuals were found occasionally in blacklight traps.

Distribution. This species occurs coastally from southern Texas to Florida, and northward into western Louisiana, Arkansas, and Missouri, with a disjunct population in the New England region (Gundersen, 1978). This species occurs throughout Mississippi, but populations are scattered (Map 38).

Specimens examined: 43 (Appendix 38).

Enochrus cinctus (Say)

Figure 73, Map 39

Hydrophilus cinctus Say, 1824. Western Quart. Reporter 2: 276.

Diagnosis. Length 4.9-7.5 mm. The unique, undercut mesosternal crest (Figure 73), large size, and pale borders of the thorax and elytra distinguish this species.

Notes. *Enochrus cinctus* is common in southern Mississippi, and specimens are collected often at light. The species appears to prefer well-established ponds, but several specimens were collected in light traps placed near streams.

Distribution. This species occurs throughout the eastern two-thirds of the United States and southern Canada (Gundersen, 1978). Populations were encountered most often in southern Mississippi (Map 39).

Specimens examined: 47 (Appendix 39).

Enochrus consors (LeConte)

Figures 64, 72, Map 40

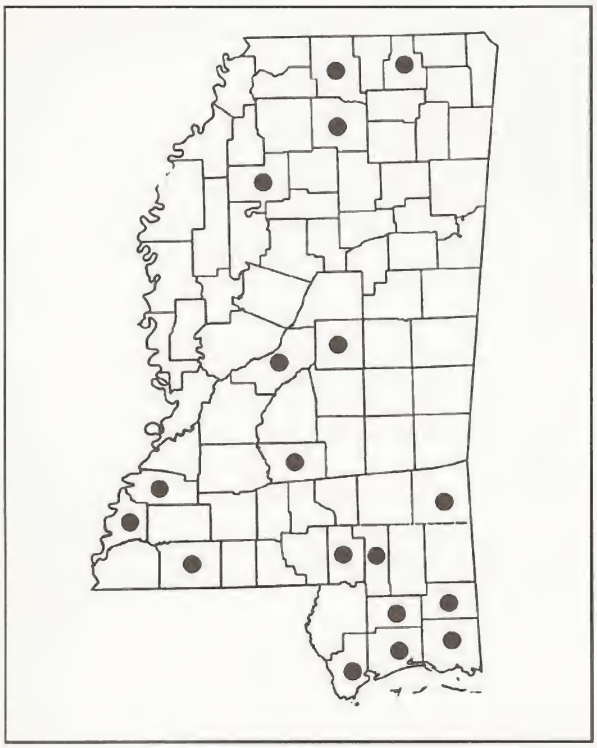
Philhydrus consors LeConte, 1863. Smithson. Misc. Coll. 6: 24.

Diagnosis. Length 6.8-8.2 mm. *Enochrus consors* is very similar to both *E. cinctus* and *E. consortus*, but it lacks the posteriorly undercut mesosternal crest of *E. cinctus* and has the elytra and pronotum completely black, unlike either of the similar species that have pale margins.

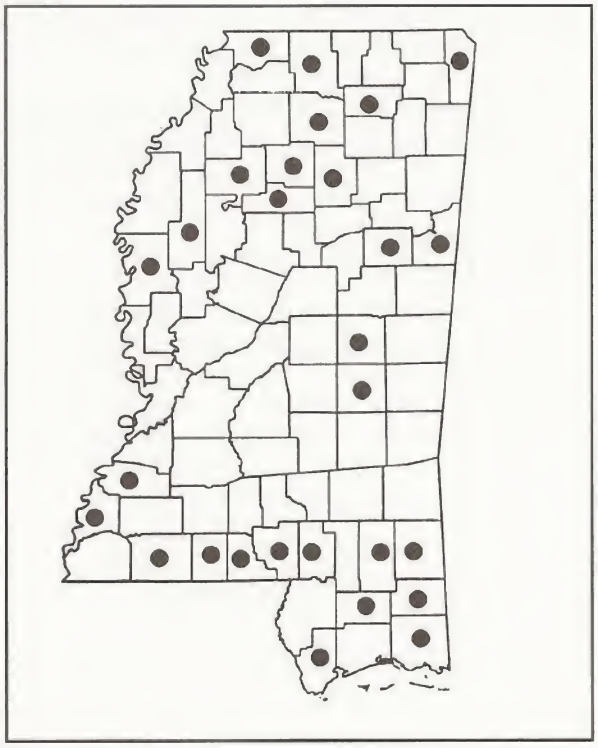
Notes. *Enochrus consors* was collected from a variety of lentic habitats, including the margins of well-established lakes, waterlily ponds, woodland ponds, and swamps. Specimens were collected often at blacklight .

Distribution. This species occurs along the Gulf and Atlantic coasts from Louisiana to Florida, north to New England, and inland along and west of the Great Lakes (Gundersen, 1978). It was reported from Horn Island by Richmond (1968), and it is encountered most often in the southern part of Mississippi (Map 40).

Specimens examined: 73 (Appendix 40).



Map 40. *Enochrus consors.*



Map 41. *Enochrus consortus.*

Enochrus consortus Green
Figure 71, Map 41

Enochrus consortus Green, 1946. Trans. Amer. Entomol. Soc. 72: 61.

Diagnosis. Length 6.0-7.6 mm. *Enochrus consortus* is very similar to both *E. cinctus* and *E. consors.* Pale elytral and pronotal margins and an entire mesosternal crest distinguish *E. consortus*.

Notes. This species was collected often with light traps. Most specimens captured with nets were collected from well-established lentic habitats, including heavily vegetated lakes and ponds.

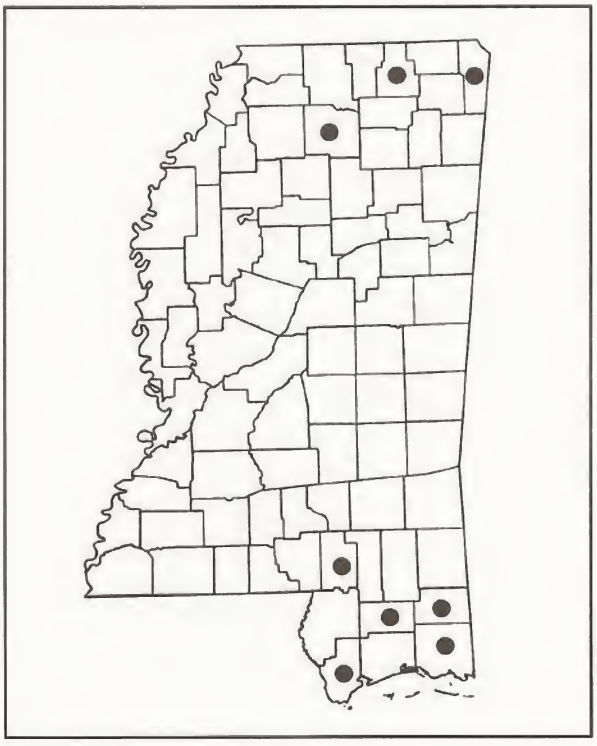
Distribution. *Enochrus consortus* occurs throughout the eastern half of the United States. It was reported from Horn Island by Richmond (1968), and it has been collected widely in Mississippi (Map 41).

Specimens examined: 198 (Appendix 41).

Enochrus hamiltoni (Horn)
Figure 78, Map 42

Philhydrus hamiltoni Horn, 1890. Trans. Amer. Entomol. Soc. 17: 249.

Diagnosis. Length 4.3-6.1 mm. *Enochrus hamiltoni*, lacking an emargination or golden fringe on the apex of the fifth visible abdominal sternite, can be confused easily with *E.*



Map 42. *Enochrus hamiltoni.*

reflexipennis. *Enochrus hamiltoni*, however, is larger and generally darker and lacks the slightly extended and tapered apices of the elytra, which are characteristic of *E. reflexipennis*.

Enochrus interruptus and *E. perplexus* could be mistaken for *E. hamiltoni* due to their very small emarginations of the abdomen. Both of these species have a mostly glabrous mesosternal crest, whereas in *E. hamiltoni*, the crest is setose throughout (Figure 78).

Notes. Most specimens were collected with blacklight traps in tidal marshes in Hancock County, Mississippi, but others were collected from an oxbow lake and a large waterlily pond and with a light trap near a medium-sized stream.

Distribution. This species occurs throughout the United States and Canada. Reported from Horn Island by Richmond (1962), the species is encountered commonly in coastal and adjacent counties of Mississippi; a few specimens have been collected in northern Mississippi (Map 42).

Specimens examined: 493 (Appendix 42).

Enochrus interruptus Gundersen
Figures 66, 70, 74, Map 43

Enochrus interruptus Gundersen, 1977. Coleopts Bull.31: 255.

Diagnosis. Length 4.8-6.0 mm. *Enochrus interruptus* is most similar to *E. perplexus*, but the latter has a very shallow emargination of the fifth sternite (width/depth approximately 7.0), often obscured by a golden fringe, whereas in *E. interruptus*, the emargination is deep and distinct (width/depth approximately 4.5). The male genitalia are distinctive (Figure 70). Also, *E. interruptus* is known only from coastal counties, whereas *E. perplexus* occurs throughout Mississippi. This species can be differentiated quickly from small specimens of *E. consors* and *consortus* by the much deeper emargination of the fifth sternum in the latter two species (width/depth approximately 3.0). Pale specimens of *E. interruptus* will key to *E. blatchleyi*, but the abdominal emargination of *E. blatchleyi* is much deeper (width/depth approximately 2.0).

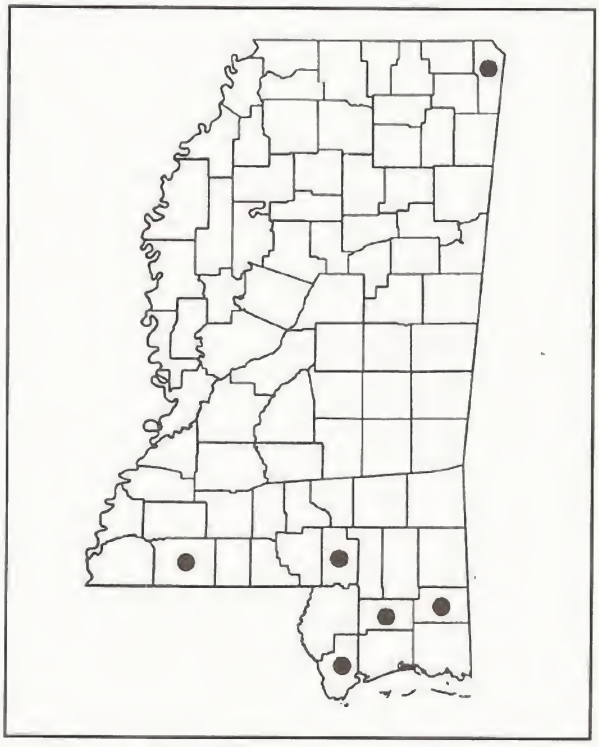
Notes. *Enochrus interruptus* is encountered infrequently in Mississippi. Blacklight traps near eutrophic lakes and ponds yielded most specimens, but one individual was collected in a light trap near a small stream.

Distribution. *Enochrus interruptus* occurs from coastal Louisiana to Florida and southern Georgia (Gundersen, 1978), and it was collected most often in southern counties of Mississippi during this study (Map 43).

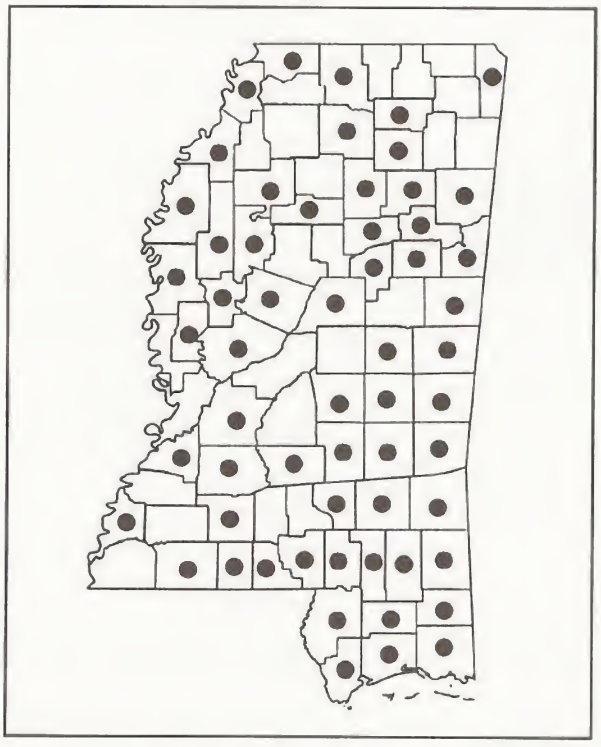
Specimens examined: 36 (Appendix 43).

Enochrus ochraceus (Melsheimer)
Figure 75, Map 44

Philhydrus ochraceus Melsheimer, 1846. Proc. Acad. Natur. Sci. Philadelphia 2: 101.



Map 43. *Enochrus interruptus.*



Map 44. *Enochrus ochraceus.*

Diagnosis. Length 2.5-4.0 mm. The distinctive low, smoothly rounded mesosternal keel (Figure 75) readily differentiates this species from all members of the genus except *E. sublongus*. Specimens of *E. ochraceus* are almost always larger than *E. sublongus* (2.2-2.7 mm, rarely more than 2.5 mm) and have epipleura that are dark throughout, rather than pale as in the latter species.

Notes. Specimens of *Enochrus ochraceus* were collected in nearly every type of aquatic habitat sampled in Mississippi and were attracted often to blacklight in large numbers. Habitats included flooded ditches, small streams, woodland pools, large waterlily ponds, lake margins, and backwater areas of rivers. This is the most commonly collected species of *Enochrus* in the state.

Distribution. *Enochrus ochraceus* is distributed widely in the eastern half of the United States; it has been collected in Washington and California in the West and southward through Mexico to Panama (Gundersen, 1978). Previously recorded from Jackson County by Richmond (1962), the species is known now to occur throughout Mississippi (Map 44).

Specimens examined: 886 (Appendix 44).

Enochrus perplexus (LeConte)

Figures 65, 69, Map 45

Philhydrus perplexus LeConte, 1855. Proc. Acad. Natur. Sci. Philadelphia 7: 371.

Diagnosis. Length 4.2-6.0 mm. This species is nearly identical to *E. interruptus*, but it has a deeper emargination of the fifth abdominal sternite (width/depth approximately 4.5) (see diagnosis for *E. interruptus*).

Notes. Specimens were collected from well-vegetated ponds and lake margins and were attracted to blacklight.

Distribution. *Enochrus perplexus* is distributed widely in the United States, with the exception of the extreme northeastern states; it also occurs in western Mexico (Gundersen, 1978). Richmond (1962) reported it from Horn Island, Mississippi. Most records for Mississippi are from localities in the southern half of the state (Map 45).

Specimens examined: 47 (Appendix 45).

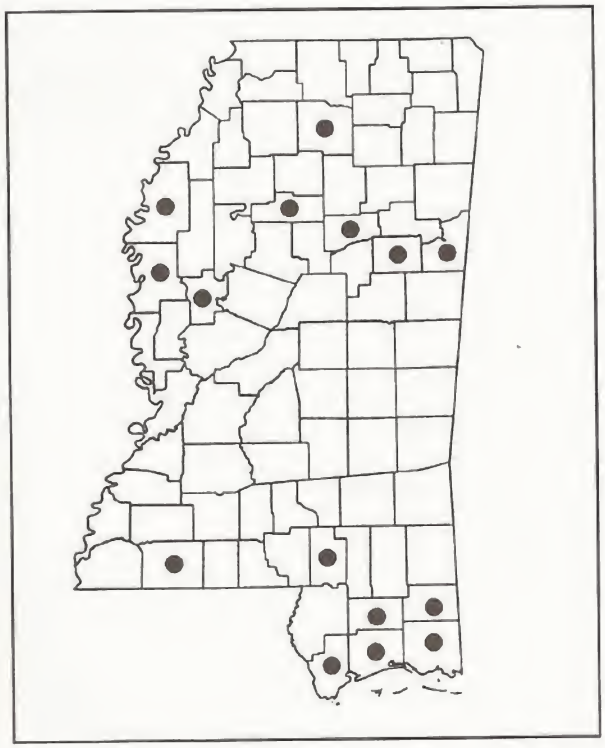
Enochrus pygmaeus (Fabricius)

Figure 77, Maps 46, 47

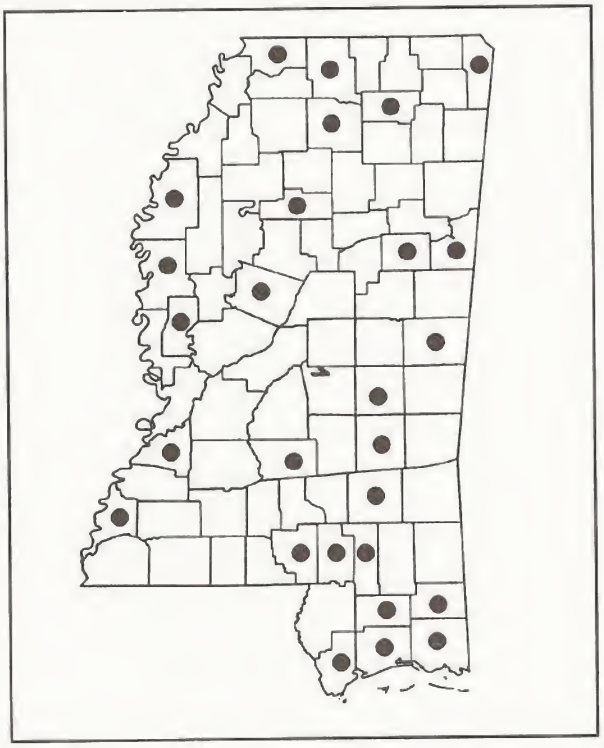
Hydrophilus pygmaeus Fabricius, 1792. Entomologia Systematica I(2): 186.

Hydrophilus nebulosus Say, 1824. Western Quart. Reporter 2: 276.

Diagnosis. Length 3.4-4.2 mm. *Enochrus pygmaeus* can be confused with *E. sayi*, but *E. pygmaeus* has the epipleura and prosternum dark and an acute anterior angle of the mesosternal crest (Figure 77). In *E. sayi*, the epipleura are pale except mesally, the prosternum is lighter than the meso- or metasternum, and the mesosternal crest has an obtuse an-



Map 45. *Enochrus perplexus.*



Map 46. *Enochrus pygmaeus nebulosus.*

terior angle (Figure 76) and, usually, a more convex profile. *Enochrus ochraceus* is similar to *E. pygmaeus* in size and dorsal coloration, but it lacks a developed mesosternal crest.

Two subspecies of *E. pygmaeus* occur in Mississippi. *Enochrus p. pygmaeus*, which occurs in the coastal counties, has a uniformly pale clypeus and a slightly more acute angle of the mesosternal crest. *Enochrus p. nebulosus*, which occurs throughout the state, has a clypeus with a darkened center and a mesosternal crest with an angle of approximately 90 degrees.

Notes. *Enochrus pygmaeus nebulosus* was encountered in a variety of lentic habitats during this study, and specimens were often collected in light traps. No specimens of *E. p. pygmaeus* were collected during this study although the coastal counties were sampled extensively. Gundersen (1978) examined specimens of the latter subspecies from the state (with Jackson and Greene Counties indicated on his range map 175), but no locality data were given.

Distribution. *Enochrus p. nebulosus* occurs throughout the eastern two-thirds of the United States, and it was found throughout Mississippi (Map 46). Typical *Enochrus pygmaeus* occurs coastally from Florida through southern Texas to Belize and inland from the west coast of Mexico through southern Texas to New Mexico and California; it has been reported from southeastern Mississippi by Gundersen (1978) (Map 47).

Specimens examined: 187 (Appendices 46 and 47).

Enochrus reflexipennis (Zimmermann)
Figure 68, Map 48

Philhydrus reflexipennis Zimmermann, 1869. Trans. Amer. Entomol. Soc. 2: 250.

Diagnosis. Length 3.4-5.0 mm. *Enochrus reflexipennis* is distinguished by the absence of an emargination of the fifth sternum and slightly prolonged and tapered elytral apices (Figure 68). Also, see the diagnosis for *E. hamiltoni*.

Notes. Most specimens from Mississippi were collected with blacklight traps in tidal marsh and other coastal areas. Several individuals were collected from brackish water ponds on Point Clear Island, Hancock County.

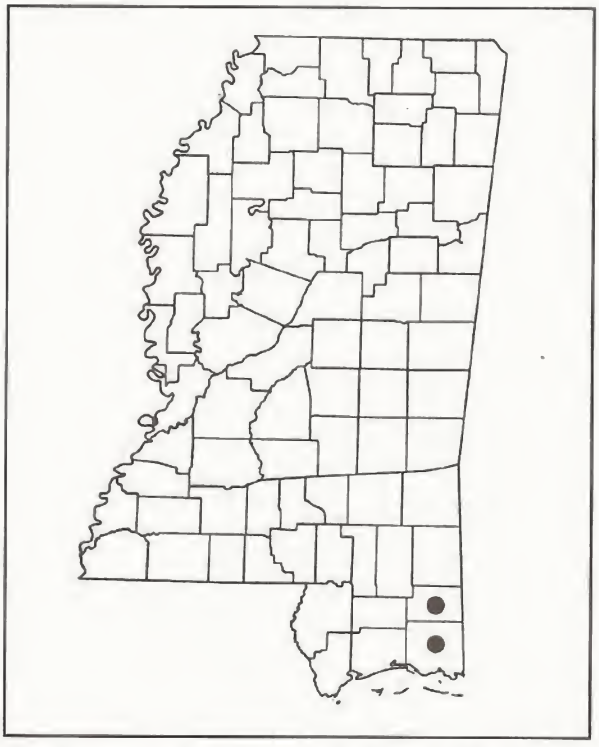
Distribution. *Enochrus reflexipennis* occurs coastally from Louisiana to Florida and northward to Nova Scotia (Gundersen, 1978). In Mississippi, the species is limited to the southern quarter of the state (Map 48).

Specimens examined: 426 (Appendix 48).

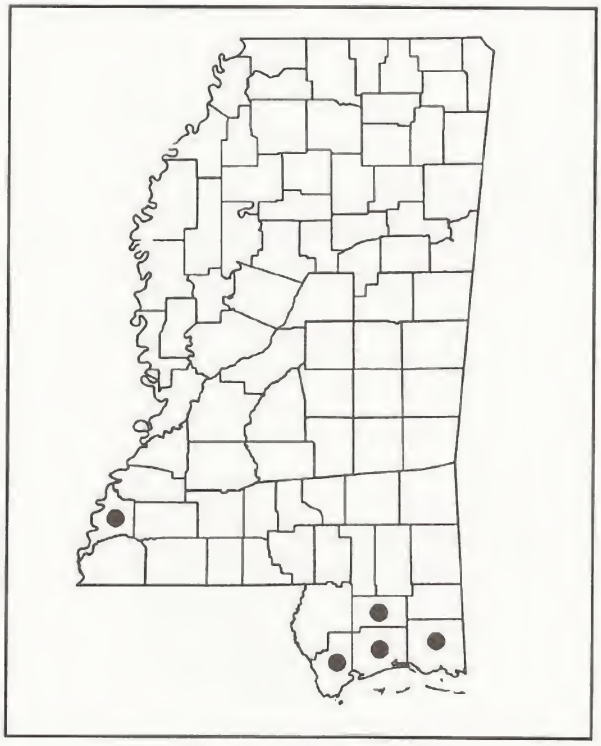
Enochrus sayi Gundersen
Figure 76, Map 49

Enochrus sayi Gundersen, 1977. Coleopts Bull. 31: 262.

Diagnosis. Length 3.5-4.1 mm. *Enochrus sayi* can be differentiated immediately from other species of *Enochrus* in Mississippi by the unique, obtuse anterior angle of the



Map 47. *Enochrus pygmaeus pygmaeus* (from Gundersen, 1978).



Map 48. *Enochrus reflexipennis*.

mesosternal crest (Figure 76) as well as by the prosternum being paler than the mesosternum. *Enochrus ochraceus* is similar in size and coloration, but it has a small, rounded mesosternal crest without an anterior angle.

Notes. *Enochrus sayi* appears to prefer lakes and other large, well-established lentic habitats. Specimens are collected occasionally with blacklight traps, but the species is not common in Mississippi.

Distribution. *Enochrus sayi* occurs in southern Texas and throughout the eastern United States (Gundersen, 1978). The species occurs throughout Mississippi (Map 49).

Specimens examined: 73 (Appendix 49).

Enochrus sublongus (Fall)
Map 50

Philhydrus sublongus Fall, 1924. J. New York Entomol. Soc. 32: 85.

Diagnosis. Length 2.2-2.7 mm. *Enochrus sublongus* is differentiated easily from most other members of the genus by its small, rounded mesosternal crest (Figure 75) and small size. It might be confused with *E. ochraceus*, which also has a rounded mesosternal crest, but *E. sublongus* is usually smaller (rarely larger than 2.5 mm) and has pale epipleura.

Notes. *Enochrus sublongus* is primarily a coastal species found in temporary pools and ditches. The species is attracted to blacklight traps, but specimens are not collected commonly.

Distribution. *Enochrus sublongus* occurs in the coastal states from eastern Texas to Virginia (Gundersen, 1978). Most specimens from Mississippi were collected in the coastal counties (Map 50).

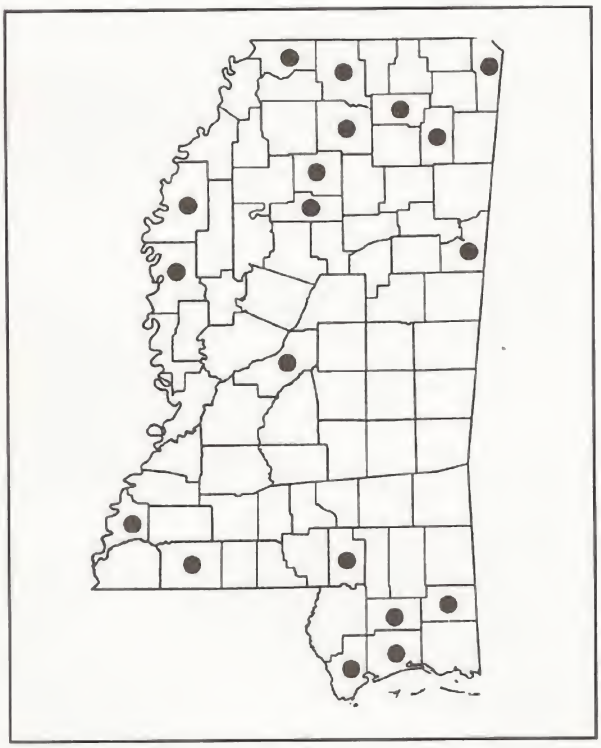
Specimens examined: 85 (Appendix 50).

Genus *Helochares* Mulsant

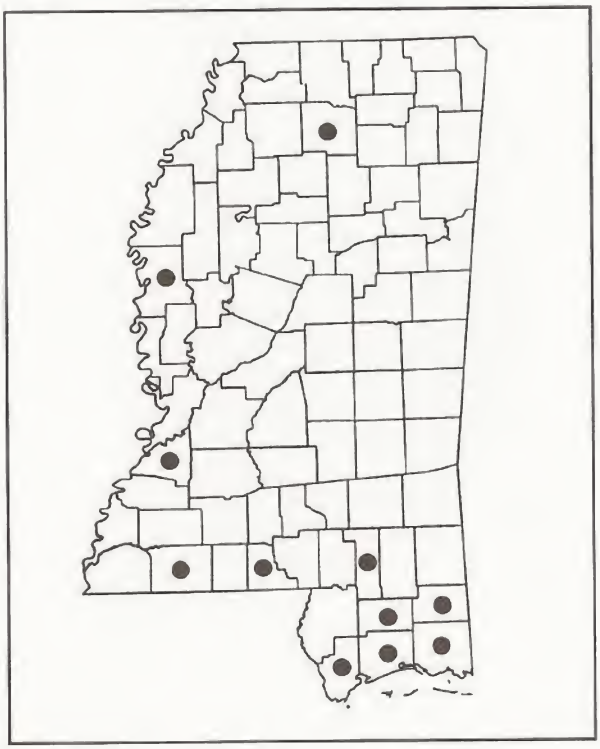
Helochares Mulsant, 1844. Histoire naturelle des Coleopteres de France. Palpicornes: 197.

Diagnosis. Although similar to some large species of *Enochrus*, species of *Helochares* lack a prominent, longitudinal mesosternal crest, and they have the pseudobasal segments of the maxillary palpi concave medially when extended (Figure 79). The tarsi in this genus are five-segmented. Females are found often with a whitish egg case attached to the ventral surface of the abdomen and, thus, are identified easily.

Notes. *Helochares maculicollis* is the only species of the genus that occurs in the United States. A Mexican species, *H. sallaei* Sharp, was reported from Florida, based on two specimens collected by Blatchley (1932), but these are thought to have been accidentally introduced through trade (Young, 1954).



Map 49. *Enochrus sayi.*



Map 50. *Enochrus sublongus.*

Helochares maculicollis Mulsant
Figure 79, Map 51

Helochares maculicollis Mulsant, 1844. Ann. Soc. d'Agric (Lyon) 7: 379.

Diagnosis. Length 4-6 mm. The characters given in the generic discussion will differentiate this species from other Hydrophilidae in the United States.

Notes. *Helochares maculicollis* can be found most often in thin-bladed, grassy vegetation at the margins of ponds and lakes. Many individuals were collected from emergent *Eleocharis* sp. Females carry eggs in a gelatinous cluster beneath the abdomen, and such females have been found from late June to mid-August. Richmond (1920) discussed the life history of this species.

Distribution. This species occurs in the eastern United States from Missouri to Washington, D.C. and south to Florida and Texas; it occurs throughout Mississippi (Map 51).

Specimens examined: 66 (Appendix 51).

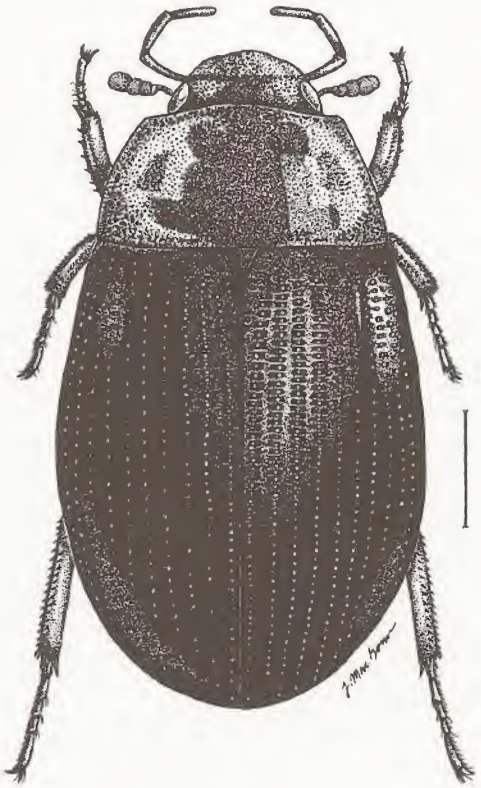
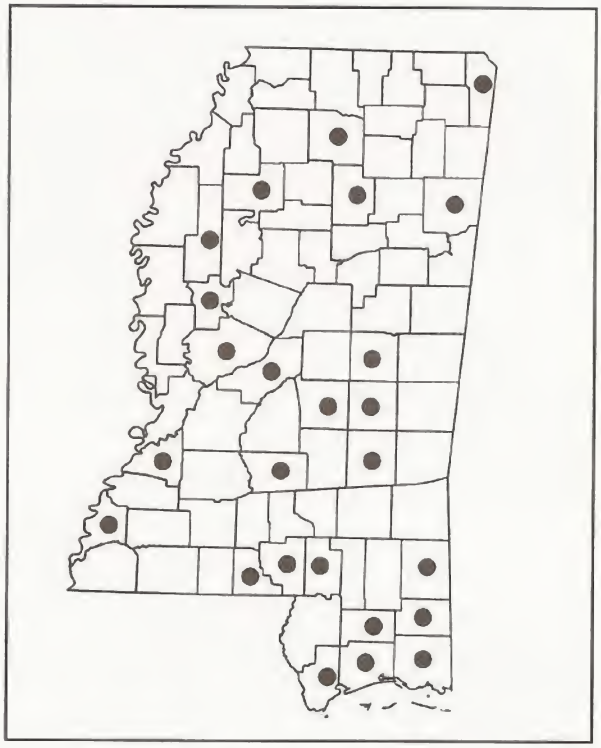


Figure 79. *Helochares maculicollis*, scale line = 1 mm.



Map 51. *Helochares maculicollis.*

Genus *Helobata* Bergroth

Helobata Bergroth, 1888. Deutsche Entomol. Zeitschr. 32: 221.

Diagnosis. Length 5-6 mm. The broadly expanded clypeus that covers the labrum, explanate lateral margins of the pronotum and elytra, and flattened body will distinguish this genus (and species).

Notes. This is a monotypic genus, containing only *H. striata* (Brullé).

Helobata striata (Brullé)
Figure 80, Map 52

Hydrophilus striatus Brullé, 1838. In d'Orbigny's Voyage dans l'Amerique Meridionale. . . ,6(part 2): 58.

Diagnosis. See the generic diagnosis .

Notes. Young (1954) and Blatchley (1932) found specimens of this species adhering tightly to submerged leaves of pickerel weed (*Pontederia* sp.). This unusual habit may account for the lack of specimens in our collections; however, they have been collected at blacklights elsewhere, and we suspect the species is very rare here. Leng and Mutchler (1918) reported the collection of a specimen from "beneath chunks of debris buried in the mud of tidewater marsh," and Young

(1954) also reported the collection of specimens from brackish water.

Spangler and Cross (1972) described the egg case and larva of this species, reporting that the female carries the egg case beneath its abdomen, as in *Helochares*.

Distribution. This species is known from Florida, Mississippi, Louisiana, Texas, Mexico, Cuba, and South America. The only record from Mississippi is by Richmond (1962) for Horn Island, Jackson County (Map 52; Appendix 52).

Specimens examined: None.

Genus *Helocombus* Horn

Helocombus Horn, 1890. Trans. Amer. Entomol. Soc. 17: 241.

Diagnosis. Length 5.5-7.5 mm. The long maxillary palpi (with the penultimate segment about as long as the width of the labrum at the front of the clypeus), distinctly striate elytra, and pyramidal mesosternal crest differentiate this monotypic genus from all other North American Hydrophilidae.

Map 52. *Helobata striata*.

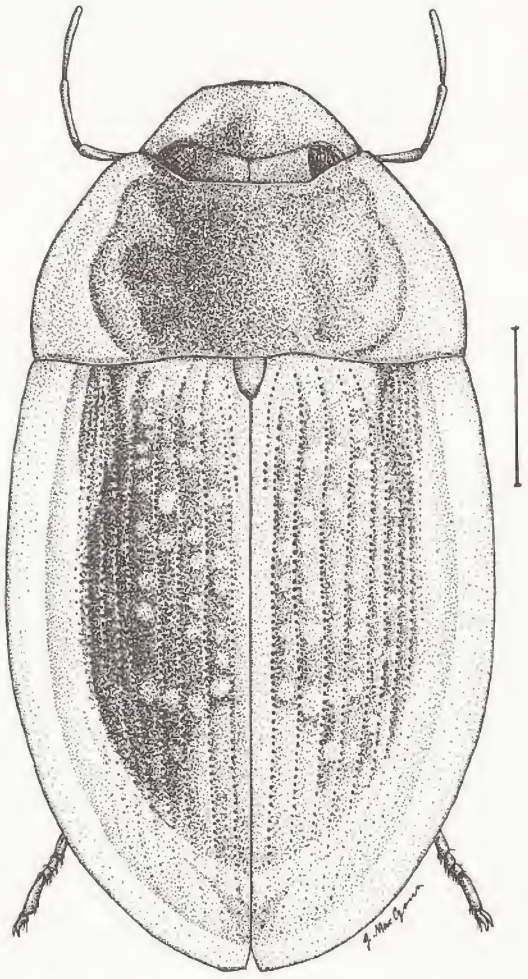


Figure 80. *Helobata striata*, scale line = 1 mm.

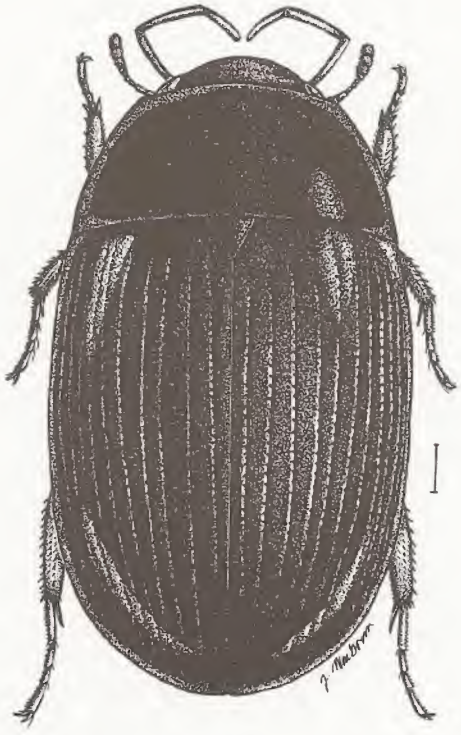
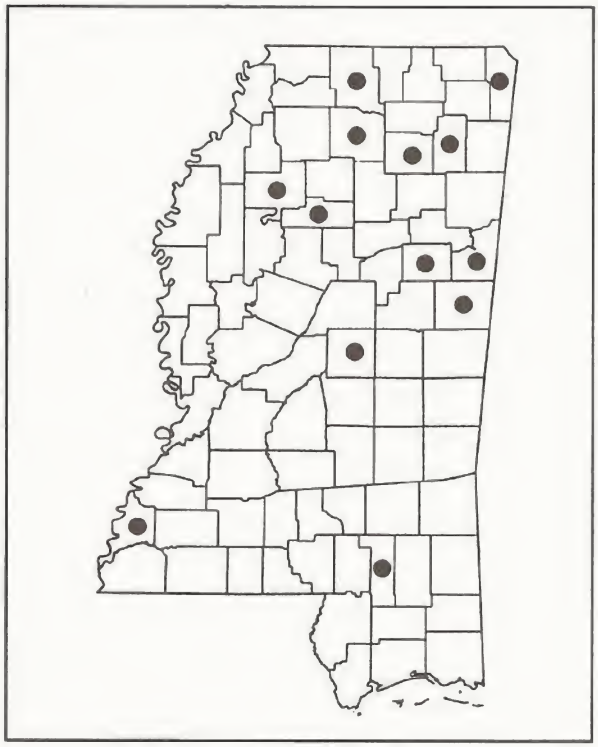


Figure 81. *Helocombus bifidus*, scale line = 1 mm.



Map 53. *Helocombus bifidus.*

Helocombus bifidus (LeConte)
Figure 81, Map 53

Philhydrus bifidus LeConte, 1855. Proc. Acad. Natur. Sci. Philadelphia 7: 371.

Diagnosis. See the generic diagnosis.

Notes. *Helocombus bifidus* was collected infrequently, mostly from lake margins with grass or other thin-stemmed vegetation. According to Young (1954) and Perkins and Spangler (1981), this species typically occurs in woodland ponds. Perkins and Spangler (1981) described the larva.

Distribution. This species occurs from Labrador to Florida (Young, 1954) and west to Mississippi. The species was encountered most often in northern Mississippi during this study (Map 53).

Specimens examined: 80 (Appendix 53).

Genus *Cymbiodyta* Bedel

Cymbiodyta Bedel, 1881. Appendix to Ann. Soc. Entomol. France: 307.

Diagnosis. Species of *Cymbiodyta* (Figure 82) are similar in form to those of *Enochrus*, but they are unique in having only four tarsomeres in the middle and hind tarsi, the maxillary palpus (when extended) with a mesally concave pseudobasal segment (Figure 82), and a transverse, rather than longitudinal, mesosternal crest (Figure 83).

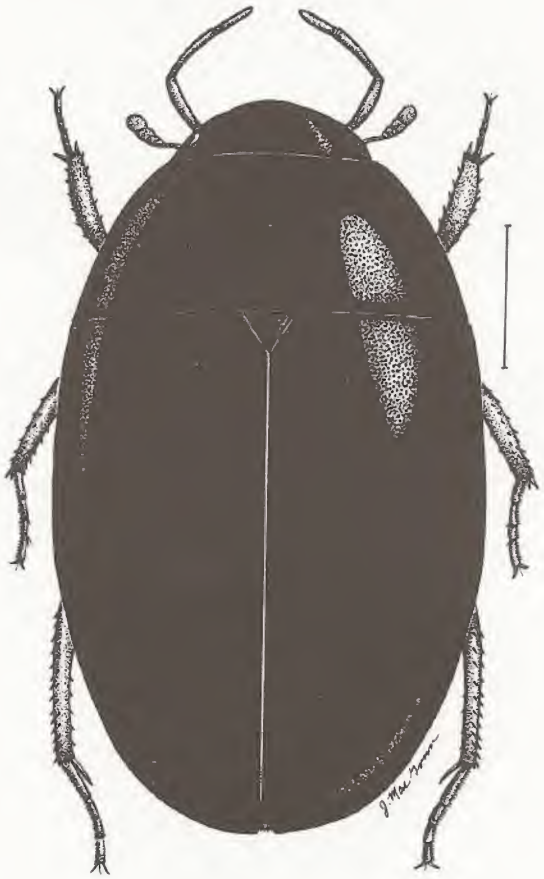


Figure 82. *Cymbiodyta vindicata*, scale line = 1 mm.

Figure 83. Mesosternum of *Cymbiodyta chamberlaini*, arrow = concavity below transverse ridge.

The shape of the mesosternal crest is a primary character for differentiating the species, but it shows considerable variation within some species and is not always a useful character. The degree of emargination of the fifth abdominal sternite is also variable, with the emargination being present or absent in some species. To avoid the sole use of genitalic characteristics for separating superficially similar species, some species are entered more than once in the following key.

Smetana (1974) considered the extent of pubescence on the metafemora to be constant and the form of the male genitalia to also be distinctive. Secondary sexual characteristics are not visible, and the examination of genitalia is the only apparent means of sexing the beetles.

Notes. Smetana (1974) revised this genus and recognized 29 species worldwide, including nine from the eastern United States; of these, three have been collected in Mississippi, and two others possibly occur here.

Key to Species of *Cymbiodyta* in Mississippi
(modified from Smetana, 1974)

1. Fifth abdominal sternite distinctly emarginate apically 2
   Fifth abdominal sternite entire or truncate apically .. 4
2. Clypeus distinctly testaceous in front of eyes ..... *C. chamberlaini* Smetana
   Clypeus not distinctly testaceous in front of eyes ... 3
3. Length 2.6-3.5 mm; male genitalia as in Figure 84 ..... *C. minima* Notman
   Length 3.5-5.3 mm; male genitalia as in Figure 85 .. .. *C. vindicata* Fall (part)
4. Nonpubescent portion of hind femora confined to apical fifth or sixth; male genitalia with apical portions of parameres sinuate medially (Figures 84 and 85); length 2.6-5.3 mm 5
   Nonpubescent portion of hind femora confined to about apical fourth; male genitalia with apical portions of parameres not sinuate medially (Figures 86 and 87); length 3.9-5.5 mm 6
5. Length 2.6-3.5 mm; male genitalia as in Figure 84 ..... *C. minima* Notman
   Length 3.5-5.3 mm; male genitalia as in Figure 85 ..... *C. vindicata* Fall (part)
6. Male genitalia with parameres very broad basally, broadly sinuate laterally before very sharp apices (Figure 86); length 4.0-5.5 mm ..... *C. toddi* Spangler
   Male genitalia with parameres only moderately broad basally, not sinuate laterally before moderately sharp apices (Figure 87); length 3.9-4.9 mm ..... *C. semistriata* (Zimmermann)

***Cymbiodyta chamberlaini* Smetana**
Figures 83, 88, Map 54

Cymbiodyta chamberlaini Smetana, 1974. Mem. Entomol. Soc. Canada 93: 57.

Diagnosis. Length 4.0-5.7 mm. *Cymbiodyta chamberlaini* is usually easy to recognize because of its relatively large size, distinct, testaceous preocular spots, distinctly emarginate apex of the fifth sternite, very short, nonpubescent area of the hind femora, and the shape of the genitalia (Figure 88).

Notes. In Mississippi, specimens were collected with light traps near lakes, waterlily ponds, and both small and large streams. Our data support Smetana's (1974) conclusion that *C. chamberlaini* occurred in both running and still water. Smetana believed that seepages were the preferred habitat, and he indicated that immature (teneral?) specimens were numerous in July. *Cymbiodyta chamberlaini* is the most common member of this genus in Mississippi.

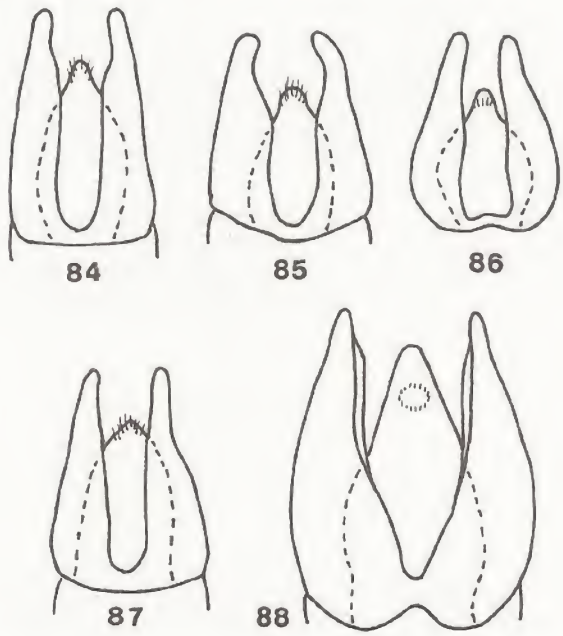
Distribution. *Cymbiodyta chamberlaini* occurs from northern Illinois to Massachusetts, south to Florida, and west to eastern Texas (Smetana, 1974). Though ranging widely in Mississippi, populations are scattered (Map 54).

Specimens examined: 83 (Appendix 54).

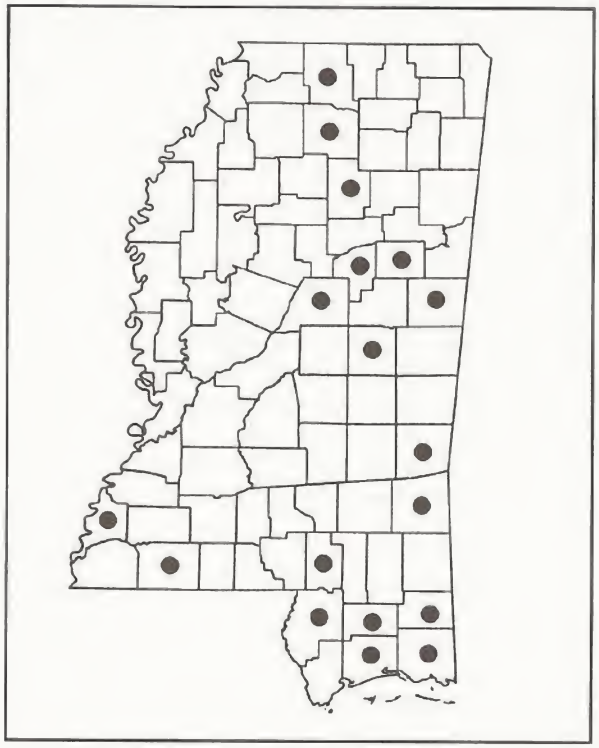
***Cymbiodyta minima* Notman**
Figure 84

Cymbiodyta minima Notman, 1919. Bull. Brooklyn Entomol. Soc. 14: 133.

Diagnosis. Length 2.6-3.5 mm. This is the smallest species of *Cymbiodyta* in Mississippi. In addition to size, it differs from the other members of the genus in the shape of the male genitalia (Figure 84).



Figures 84 - 88. Male genitalia of *Cymbiodyta* species, dorsal view. 84, *Cymbiodyta minima*; 85, *Cymbiodyta vindicata*; 86, *Cymbiodyta toddi*; 87, *Cymbiodyta semistriata* 88, *Cymbiodyta chamberlaini*.



Map 54. *Cymbiodyta chamberlaini.*

Notes. Collection records in Smetana (1974) included "sifting humus," "sifting dead swamp grass," "shallow pool in woods," and "flying." He collected specimens by sifting wet sphagnum moss from bogs in Illinois and British Columbia and indicated that the species can be found frequently in very moist habitats out of water. This species has not been collected yet in Mississippi.

Distribution. *Cymbiodyta minima* is most common in the northeastern quarter of the United States, but it ranges south to Arkansas and Alabama (Smetana, 1974) and probably occurs in northern Mississippi. This species is apparently rare in the southern portions of its range.

Cymbiodyta semistriata (Zimmermann)
Figure 87, Map 55

Philhydrus semistriata Zimmermann, 1869. Trans. Amer. Entomol. Soc. 2: 250.

Diagnosis. Length 3.9-4.9 mm. In *C. semistriata*, the mesosternal ridge is not elevated, the abdominal apex is not emarginate, and the metafemora lacks pubescence on the apical one-fourth of its length. The shape of the genitalia (Figure 87) is the only reliable character for separating this species from *C. toddi*.

Notes. This species was known under the name *Philhydrus fimbriatus* Melsheimer for many years, but the type of *fimbriatus* is actually an *Enochrus* (Smetana, 1974). Smetana (1974) considered *C. semistriata* (Zimmermann) to be the oldest available name for this species.

The specimens from Mississippi were collected in a blacklight trap placed near a stream.

Distribution. *Cymbiodyta semistriata* is distributed widely in the eastern half of the United States, although it has not been reported previously from the Gulf Coastal states. The single locality for the species in Mississippi (Map 55) represents a significant southerly extension of the known range of this species.

Specimens examined: 2 (Appendix 55).

Cymbiodyta toddi Spangler
Figure 86

Cymbiodyta toddi Spangler, 1966. Entomol. News 77: 211.

Diagnosis. Length 4.0-5.5 mm. The mesosternal ridge is not elevated, the abdominal apex is not emarginate, and the metafemora lacks pubescence on the apical one-fourth of its length. Examination of the male genitalia (Figure 86) is necessary to separate individuals of *C. toddi* from *C. semistriata*.

Notes. Most specimens have been collected from the margins of standing waters, especially in dead leaves and other decaying material (Smetana, 1974).

Distribution. This species is distributed widely in the

Map 55. *Cymbiodyta semistriata.*

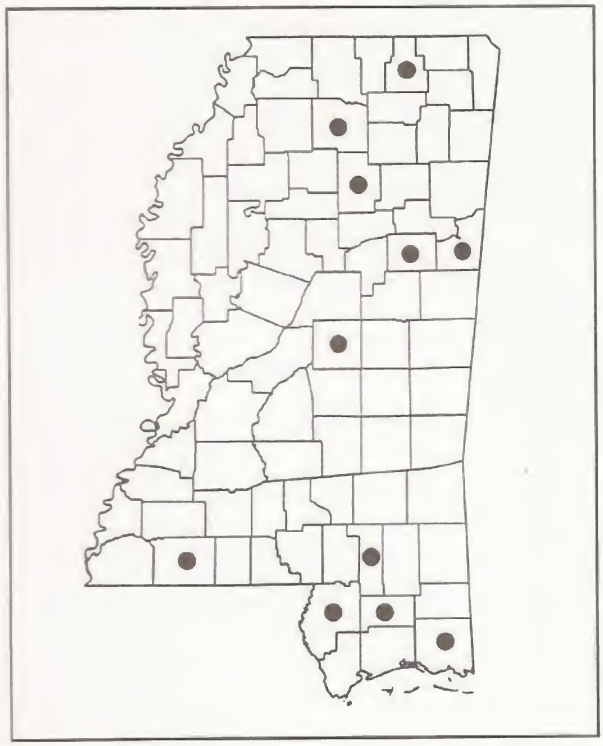
eastern United States. Although it occurs in northern Arkansas and central Tennessee, no specimens have been collected in Mississippi. The species may be found eventually in the Tombigbee-Tennessee River Hills region in the state.

Cymbiodyta vindicata Fall
Figures 82, 85, Map 56

Cymbiodyta vindicata Fall, 1924. J. New York Entomol. Soc. 32: 86.

Diagnosis. Length 3.5-5.3 mm. This species is quite variable in external characteristics, but the shape of the male genitalia is distinctive (Figure 85).

Notes. As is true of other species in this genus, *C. vindicata* is not restricted to aquatic habitats. Smetana (1974) reported the following habitat data: "sifting humus" and "sifting sphagnum moss," as well as "stream," "spring seepage," and "sphagnum-pool." In Mississippi, specimens of *C. vindicata* have been collected from thick silt under a stand of cattails (*Typha* sp.) in a marshy, roadside area and from a tiny, woodland stream. More specimens were collected in light traps than from direct sampling of aquatic habitats.



Map 56. *Cymbiodyta vindicata.*

Distribution. *Cymbiodyta vindicata* has a wide range in North America (except the southwestern United States), and it occurs throughout Mississippi (Map 56).

Specimens examined: 15 (Appendix 56).

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Appendices 1-56.

Data for aquatic Hydrophilidae in Mississippi. The following 56 appendices include the label data for the material examined as well as data given in selected publications (with author and date of publication in parentheses). As label data varied in completeness, abbreviations, and format, the data presented here were edited for consistency. To conserve space, specimens collected within a 5-day period in a given month of the same year were grouped together if other data, with exception of the collectors, were identical. Mercury vapor (mv) and blacklight (bl.light) are abbreviated accordingly. The first column gives the number of specimens examined and the last column gives ecological and related data.

Appendix 1. ***Chaetarthria pallida.***

No. County	Site	Date	Collector	Other Data
1 Bolivar	2 mi W Rosedale	10 Oct 1980	P.K. Lago	
37 Grenada	T21N,R2E, Sec. 12,13N & R3E, Sec. 7S,18N	28 Aug-3 Sep 1991	T.L. Schiefer	bl.light on sandbar
Jackson	Horn Island		(Richmond, 1962)	
1 Wilkinson	Buffalo Riv. X Hwy 61	24 Jun 1982	P.K. Lago	

Appendix 2. ***Helophorus linearis.***

1 Adams	Natchez	23 Jun 1982	A.E. Zuccaro Jr.
1 Amite	7 mi ENE Liberty	25 Jun 1987	S. Testa III
1 Bolivar	2 mi W Rosedale	11 Apr 1986	S. Testa III
9 Clay	5 mi W West Point	6 Nov 1987	P.K. Lago
4 Copiah	3 mi W Wesson	26 Apr 1987	S. Testa III
1 Harrison	13 mi E Saucier	27 Feb 1988	P.K. Lago
1 Hinds	4.5 mi NW Clinton	19 May 1986	P.D. Hartfield
1 Holmes	Holmes Co. St. Pk.	1 Jul 1986	P.K. Lago
5 Humphreys	4 mi SW Belzoni	26 Jun 1987	S. Testa III
1 Issaquena	Valley Park	26 Jun 1987	S. Testa III
1 Lafayette	9 mi NE Oxford	15 Sep 1980	E.A. Ivy
2 Lafayette	5 mi E Oxford	20 Jun 1977	D.F. Stanford
1 Lafayette	6 mi ENE Oxford	17 Apr 1980	P.K. Lago
1 Lafayette	Oxford	4 May 1977	P.K. Lago
2 Lafayette	Oxford	4 Jun 1982	P.K. Lago
2 Lafayette	Oxford	7 Jun 1978	P.K. Lago
1 Lafayette	Oxford	16 Jul 1979	P.K. Lago
1 Lafayette	Oxford	16 Jul 1982	P.K. Lago
3 Lafayette	Oxford	23-25 Jul 1982	P.K. Lago
1 Lafayette	Oxford	17 Aug 1982	P.K. Lago
1 Lamar	5 mi N Baxterville	23 May 1980	P.K. Lago
6 Leake	Carthage	8 May 1979	P.K. Lago
6 Lincoln	3.5 mi SW Brookhaven	26 Apr 1987	S. Testa III
1 Marshall	Wall Doxey St. Pk.	9 Sep 1980	P.K. Lago
3 Neshoba	1.5 mi N Dixon	9 May 1979	P.K. Lago
1 Neshoba	7 mi SW Philadelphia	9 May 1979	P.K. Lago
1 Newton	6 mi SE Newton	10 May 1975	P.K. Lago
7 Quitman	2 mi NE Marks	15 Jul 1978	D.F. Stanford
1 Rankin	T4N,R1E, Sec. 20	22 Jul 1979	W.C. Northern
1 Scott	Harperville	28 Feb 1988	S. Testa III
2 Scott	3.5 mi SW Forest	28 Feb 1988	P.K. Lago
1 Sharkey	2.5 mi E Anguilla	26 Jun 1987	S. Testa III
4 Sharkey	Rolling Fork	26 Jun 1987	S. Testa III
20 Tishomingo	5 mi E. Tishomingo	9 Jun 1984	P.K. Lago
26 Tishomingo	Tishomingo St. Pk.	1 Jun 1992	P.K. Lago bl.light
1 Tishomingo	Tishomingo St. Pk.	9 Jun 1984	P.K. Lago
1 Tunica	5.5 mi W Robinsonville	17 Jun 1978	P.K. Lago
2 Walthall	6 mi NE Tylertown	26 Apr 1987	S. Testa III
1 Wayne	Waynesboro	19 May 1983	P.K. Lago

Appendix 3. ***Helophorus marginicollis.***

1 Alcorn	15.5 mi W Corinth	18 May 1992	P.K. Lago	bl.light
2 Clarke	11 mi WSW Quitman	14 Jun 1987	S. Testa III	
2 Forrest	5 mi S Brooklyn	24 May 1987	S. Testa III	
1 Grenada	T21N, R3E, Sec. 7SW	18 Jun 1990	T.L. Schiefer	bl.light
1 Hancock	2 mi N Waveland Bayou LaCroix	23 May 1987	W.H. Cross	
1 Hinds	4 mi N Clinton	21 May 1977	B.P. Stark	
1 Jasper	6 mi NW Montrose	7 May 1980	P.K. Lago	
1 Jeff. Davis		27 Jun 1973	J.R. McCoy	
3 Lincoln	3.5 mi SW Brookhaven	26 Apr 1987	S. Testa III	
1 Lowndes	14 mi W Columbus	20 May 1992	P.K. Lago	bl.light
1 Lowndes	T17N, R16E, Sec. 34	18 Jun 1990	D.M. Pollock	bl.light
5 Lowndes	T17N, R16E, Sec. 34	19 Jun 1991	D.M. Pollock	bl.light
1 Oktibbeha	T18N, R14E, Sec. 23	30 May 1989	R.L. & B. Brown	mv
3 Oktibbeha	T19N,R15E, Sec. 16	21 Apr 1987	T.L. Schiefer	
7 Oktibbeha	Adnton	2-4 May 1981	W.H. Cross	bl.light
49 Oktibbeha	Adnton	3-5 Jun 1981	W.H. Cross	bl.light
1 Oktibbeha	Bethel Rd.	2 Jul 1981	S. Clemmer	
1 Oktibbeha	Craig Springs	3 Jan 1982	W.H. Cross	
1 Oktibbeha	Craig Springs	12 Nov 1981	W.H. Cross	
4 Oktibbeha	Craig Springs	19 Nov 1981	G.L. Snodgrass	
1 Oktibbeha	Craig Springs	27 Nov 1981	W.H. Cross	
1 Oktibbeha	Craig Springs	3 Dec 1982	G.L. Snodgrass	
1 Oktibbeha	Noxubee Natl. W. Refuge	11 Mar 1981	G.L. Snodgrass	
1 Oktibbeha	Starkville	5 Mar 1985	A. Asquith	
1 Oktibbeha	Starkville	9-10 Apr 1981	W.H. Cross	bl.light
1 Oktibbeha	Starkville	29 Apr 1981	R.L. Brown	bl.light
1 Oktibbeha	Starkville	5 May 1982	R.L. Brown	bl.light
1 Oktibbeha	Starkville	19 May 1981	R.L. Brown	bl.light
2 Oktibbeha	Starkville	28 May 1982	W.H. Cross	bl.light
4 Oktibbeha	Starkville	29 May 1981	R.L. Brown	bl.light
1 Oktibbeha	Starkville	3 Jun 1985	C.M. Felland	
4 Oktibbeha	Starkville	20-22 Jun 1982	R.L.Brown	bl.light
1 Oktibbeha	State Coll. [MS St Univ]	24 Apr 1932	W. L. Cabaness	
1 Oktibbeha	State Coll. [MS St Univ]	7 May 1932	J.P. Moran	
1 Oktibbeha	6 mi SW Starkville	15 Jun 1984	R.L. & B. Brown	bl.light
1 Panola	4 mi ENE Como	8 Jun 1979	W.P. Scott	
1 Pontotoc	1 mi N Pontotoc	21 Jun 1977	P.B. Head	
1 Pontotoc	1 mi SE Ecru	22 May 1980	W.H. Cross	
1 Pontotoc	1 mi SE Ecru	19 Jun 1980	W.H. Cross	
1 Quitman	2 mi NE Marks	15 Jul 1978	D.F. Stanford	
1 Scott	3.5 mi SW Forest	28 Feb 1988	P.K. Lago	
1 Scott	Golden Mem. St. Pk.	28 Feb 1988	P.K. Lago	
1 Sharkey	2.5 mi E Anguilla	26 Jun 1987	S. Testa III	
10 Tishomingo	5 mi E Tishomingo	9 Jun 1984	P.K. Lago	
1 Tishomingo	Tishomingo St. Pk	8 Jul 1988	S. Testa III	
1 Union	2 mi NE Etta	12 May 1992	P.K. Lago	bl.light

Appendix 4. ***Hydrophilus triangularis.***

1 Amite	Liberty	Summer 1920	B.H. Day
1 Adams	14 mi E Sibley, Pipe Lake	25 Jun 1987	P.K. Lago
1 Adams	Natchez	23 Jun 1982	A.E. Zuccaro Jr.
1 Bolivar	Scott	1 May 1910	F. Riggs
1 Bolivar	Scott	22 May 1913	
1 Calhoun	Vardamon	20 Jul 1971	J.E. Hollis
2 Clay		1-4 Sep 1989	R. Whitefoot
1 Jackson		4 Aug 1977	J.C. Spaud
1 Lafayette	8 mi NE Oxford	15 Jul 1986	P.K. Lago
1 Lafayette	Oxford	30 Jun 1992	E.B. Lago
1 Lafayette	Oxford	25 Mar 1989	E.B. Lago
1 Lafayette	Oxford	5 May 1989	P.K. Lago
1 Lafayette	Oxford	17 Jun 1992	E.B. Lago
1 Lafayette	Oxford	10 May 1972	S. Caboche
2 Lafayette	Oxford	14 Mar 1977	H. Schuster
2 Lafayette	Oxford	7 Apr 1977	G. Sparks
12 Lafayette	Oxford	12-14 Apr 1977	M.J. Chapman, H. Schuster
2 Lafayette	Oxford	15 Apr 1977	S.E. Hurdle, S. Elliot
1 Lafayette	Oxford	20 May 1977	A.E. Zuccaro Jr.
3 Lafayette	Oxford	17 Aug 1977	S.E. Hurdle
1 Lafayette	Oxford	24 Mar 1978	M.O. Mann
3 Lafayette	Oxford	31 Mar 1978	S.E. Hurdle
3 Lafayette	Oxford	3-7 Apr 1978	P.K. Lago, S. Hurdle
1 Lafayette	Oxford	1 Aug 1978	P.K. Lago
1 Lafayette	Oxford	30 Mar 1981	P.K. Lago
2 Lafayette	Oxford	17 Mar 1982	P.K. Lago
1 Lafayette	Oxford	8 Oct 1984	P.K. Lago
1 Lafayette	Oxford	10 Sep 1985	S. Testa III
1 Lafayette	Oxford	17 Sep 1985	S. Testa III
1 Lafayette	Oxford	10 Oct 1985	S. Testa III
6 Lafayette	Oxford	31 Mar 1986	S. Testa III
5 Lafayette	Oxford	1-3 Apr 1986	S. Testa III, P.C. Go
2 Lafayette	Oxford	11 Apr 1986	P.C. Go
1 Lafayette	Oxford	26 May 1986	S. Testa III
3 Lafayette	Oxford	8-10 Jun 1986	S. Testa III
1 Lafayette	Oxford	15 Jun 1986	S. Testa III pond
1 Lafayette	Oxford	15 Jul 1986	M.C. Beiser
1 Lafayette	Oxford	5 Aug 1986	M.C. Beiser
1 Lafayette	Oxford	25 Jul 1987	P.K. Lago
1 Lafayette	Oxford	18 Oct 1987	P. Pryor
8 Lafayette	T7S,R2W, Sec. 34	31 Mar 1978	P.K. Lago
1 Lafayette	T7S,R2W, Sec. 34	18 May 1979	M.O. Mann
1 Lafayette	T7S,R2W, Sec. 34	16 Jul 1988	S. Testa III
8 Lafayette	U. of MS Campus	27 Jul 1978	H.L. Schuster
1 Lamar	5 mi N Baxterville	9 Apr 1981	P.K. Lago
1 Marion	Columbia	3 Jun 1920	J.W. Gibson
1 Oktibbeha	Ag. Coll [MS St. Univ.]	9 Jun 1909	T.M. Lobdell
1 Oktibbeha	Ag. Coll [MS St. Univ.]	18 Jun 1909	R.N. Lobdell
1 Oktibbeha	Ag. Coll [MS St. Univ.]	Summer 1922	R.M. Barlow
1 Oktibbeha	Starkville	1 Sep 1920	D.W. Rainey
1 Oktibbeha	Sturgis	13 May 1921	G.W. Morgan
1 Oktibbeha		29 Jul 1965	J.R. McCoy
1 Sharkey	Rolling Fork	20 Jun 1992	P.K. Lago
1 Sunflower	Indianola	20 Jun 1992	P.K. Lago
5 Tunica	5.5 mi W Robinsonville	17 Jun 1978	D.F. Stanford
1 Washington	Greenville	4 Aug 1918	F. Riggs
1 Washington	Greenville	24 May 1921	G.W. Brannon
1 Yalobusha	4 mi SW Coffeeville	17 Jul 1986	P.K. Lago
1 Yalobusha	5 mi SW Coffeeville	17 Jul 1986	P.K. Lago

Appendix 5. ***Diholocelus ovalis.***

2 Adams	14 mi E Sibley, Pipe Lake	25 Jun 1987	P.K. Lago	
2 George	12 mi SW Lucedale Rines Lake	19 May 1987	S. Testa III	
2 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	5-11 Jun 1991	T.L. Schiefer, J. MacDonald	mv & bl.light
1 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	17-23 Jul 1991	T.L. Schiefer	bl.light
1 Hancock	Stennis Space Center	25 Jun 1992	P.K. Lago	
2 Kemper	2 mi N Scooba, T12N, R18E, Sec. 29,30	8 Aug 1991	T.L. Schiefer	bl.light
1 Lafayette	Oxford	29 Mar 1977	H. Schuster	
3 Lafayette	Oxford	2-4 Apr 1986	P.C. Go, M.C. Beiser	

No. County	Site	Date	Collector	Other Data
2 Lafayette	Oxford	5 Apr 1991	P.K. Lago	
1 Lafayette	Oxford	15 Apr 1977	S.E. Hurdle	
1 Lafayette	Oxford	17 Apr 1989	P.K. Lago	
1 Lafayette	Oxford	22 Apr 1977	G. Sparks	
1 Lafayette	Oxford	27 Apr 1966	S. Testa III	
1 Lafayette	Oxford	28 Apr 1977	N.T. Barden	
1 Lafayette	Oxford	3 May 1979	P.K. Lago	
1 Lafayette	Oxford	11 May 1980	P.K. Lago	
1 Lafayette	Oxford	24 May 1980	P.K. Lago	
2 Lafayette	Oxford	8 Jun 1986	S. Testa III	
2 Lafayette	Oxford	15 Jun 1986	S. Testa III, M.C. Beiser	
1 Lafayette	Oxford	17 Jun 1992	E.B. Lago	
2 Lafayette	Oxford	20-21 Jun 1977	A.E. Zuccaro Jr., P.K. Lago	
1 Lafayette	Oxford	11 Jul 1992	M. S. Caterino	
1 Lafayette	Oxford	15 Jul 1978	P.K. Lago	
1 Lafayette	Oxford	25 Jul 1987	P.K. Lago	
1 Lafayette	Oxford	8 Jul 1980	P.K. Lago	
1 Lafayette	Oxford	25 Aug 1987	S. Testa III	
1 Lafayette	Oxford	28 Sep 1982	R. Upchurch	
1 Lafayette	Oxford	29 Sep 1973	D.J. Walker	
1 Lafayette	12 mi NE Oxford	20 Apr 1979	R.W. Geodwin	
1 Lafayette	8 mi NE Oxford	19 Jul 1986	P.K. Lago	
1 Lafayette	T7S,R2W, Sec.34	13 Apr 1977	P.K. Lago	
1 Lowndes	2.5 mi W Columbus	11 Aug 1966	S. Testa III	
1 Lowndes	Lake Lowndes St. Pk.	23 Jun 1981	P.K. Lago	
1 Marshall	T4S,R3W, Sec.12	2 Aug 1976	S.E. Hurdle	
1 Oktibbeha	T19N,R15E, Sec. 16	7 Apr 1991	D.M. Pollock	bl.light
1 Oktibbeha	T19N,R15E, Sec. 16	16 May 1991	D.M. Pollock	bl.light
1 Oktibbeha	Adaton	3 Jun 1981	W.H. Cross	
1 Oktibbeha	Adaton	15 Mar 1982	W.H. Cross	
1 Oktibbeha	Leita	Summer 1919	L. Worthington	
2 Oktibbeha	Starkville	31 Mar 1984	P. Porter	
1 Oktibbeha	Starkville	28 Apr 1970	J.R. McCoy	
1 Oktibbeha	Starkville	7 Jun 1987	M. Ledlow	
2 Oktibbeha	Starkville	23 Sep 1984	S. MacDonald	
1 Oktibbeha	Starkville	1 Oct 1978	P. Cross	
1 Oktibbeha	Ag. Coll [MS St. Univ.]	9 Jun 1909		
1 Oktibbeha	State Coll. [MS St Univ]	15 Aug 1974	G. Snodgrass	
1 Panola	4 mi WSW Pope	15 Jun 1979	W.H. Cross	
1 Pontotoc	1 mi SE Ecru	9 May 1980	P.R. Miller	
1 Pontotoc	1 mi SE Ecru	5 Jun 1960	W.H. Cross	
1 Pontotoc	1 mi SE Ecru	17 Jul 1980	W.H. Cross	
1 Stone	Univ. Miss. Forestlands	9 Apr 1992	P.K. Lago	
1 Tishomingo	Tishomingo St. Pk.	17 Jun 1977	P.K. Lago	
1 Tishomingo	Tishomingo St. Pk.	22 Jun 1981	P.K. Lago	
2 Yalobusha	4 mi SW Coffeeville	17 Jul 1986	P.K. Lago	

Appendix 6. *Tropisternus blatchleyi.*

5 Adams	4 mi E Sibley, Pipe Lake	18 May 1983	P.K. Lago	
6 Adams	Natchez	25 Jun 1987	A.E. Zuccaro Jr.	
1 Adams	Natchez St. Pk.	23 Mar 1985	R.L. Brown & S. Cho	
1 Adams	Natchez St. Pk.	23 Jun 1981	P.K. Lago	
9 Amite	7 mi ENE Liberty	25 Jun 1987	P.K. Lago	
20 Amite	Mt. Nebo Lake	25 Jun 1987	S. Testa III	
1 Bolivar	1 mi W Rosedale	19 Jun 1981	P.K. Lago	
2 Bolivar	Gr. River Rd. St. Pk.	19 Jun 1986	S. Testa III	
2 Calhoun	T11S,R5W, Sec. 25	12 Jun 1978	D.F. Stanford	
1 Carroll	Carrollton	12 Jul 1986	S. Testa III	
4 Claiborne	1.5 mi SW Port Gibson	26 Jun 1987	S. Testa III	
1 Claiborne	Sand Ck. @ waterfall	3 Jun 1986	B.P. Stark	
1 Forrest	2.5 mi NW Fruitland Park	21 May 1987	S. Testa III	
5 Franklin	7 mi SW Meadville	5 Sep 1981	P.K. Lago	
2 George	12 mi SW Lucedale	19 May 1987	P.K. Lago	
1 George	12 mi SW Lucedale	21 May 1983	P.K. Lago	
2 George	12 mi SW Lucedale	30 Jun 1987	P.K. Lago	
1 George	3 mi SSW Benndale	24 May 1980	P.K. Lago	
2 Grenada	Grenada Lake Dam Area	4 May 1985	P.K. Lago	
1 Grenada	Grenada Lake Dam Area	12 Jul 1986	S. Testa III	
3 Grenada	T21N, R3E, Sec. 7SW	18 Jun 1990	T.L. Schiefer	bl.light
2 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	10 May 1991	T.L. Schiefer	bl.light
3 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	5-11 Jun 1991	T.L. Schiefer, M.W. MacGown	mv & bl.light
1 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	19 Jun 1991	J.A. MacGown	on sandbar
1 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	17-23 Jul 1991	T.L. Schiefer	bl.light
8 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	27 Jul 1991	S. Testa III D.M. Pollock	
7 Hancock	Point Clear Island	14 Feb 1987	S. Testa III	artesian pond
1 Hancock	Point Clear Island	28 Feb 1987	S. Testa III	brackish pond
2 Hancock	Point Clear Island	24 Apr 1987	S. Testa III	brackish pond
1 Hancock	Point Clear Island	23 Jun 1987	S. Testa III	artesian pond
1 Hancock	Point Clear Island	24 Jun 1986	S. Testa III	bl.light
4 Hancock	Point Clear Island	12 Aug 1986	S. Testa III	bl.light
3 Hancock	Stennis Space Center	25 Jun 1991	P.K. Lago	
2 Hancock	1 mi SSW Lakeshore	12 Aug 1986	P.K. Lago	bl.light
1 Harrison	8 mi NE Saucier	11 Aug 1988	P.K. Lago	
1 Harrison	3.5 mi NE Saucier	14 May 1984	P.K. Lago	
2 Humphreys	10 mi SW Belzoni	26 Jun 1987	S. Testa III	
1 Issaquena	0.7 mi S Valley Park	26 Jun 1987	S. Testa III	
1 Issaquena	2 mi SW Shipland	20 Jun 1992	P.K. Lago	
1 Jackson	Lower Escatawpa River	21 Aug 1991	R. Overstreet	
1 Jackson	6 mi SSE Ocean Springs	9 May 1986	P.K. Lago	
Jackson	Horn Island		(Richmond, 1962)	
4 Jefferson	4.5 mi S Fayette	25 Jun 1987	S. Testa III	
4 Jeff. Davis		2 Jul 1973	J.R. McCoy	
6 Jeff. Davis		27 Jun 1973	J.R. McCoy	
1 Lafayette	11 mi NE Oxford	23 Jun 1981	W.C. Northern	
1 Lafayette	11 mi NE Oxford, Puskus Lake	29 Apr 1992	P.K. Lago	
1 Lafayette	Oxford	29 Apr 1989	P.K. Lago	
1 Lafayette	Oxford	11 May 1980	P.K. Lago	
1 Lafayette	Oxford	30 Jun 1983	P.K. Lago	
6 Lafayette	Oxford	9 Jul 1979	G.W. Edwards	

No. County	Site	Date	Collector	Other Data
1 Lafayette	Oxford	15 Jul 1978	P.K. Lago	
17 Lafayette	Oxford	15-16 Jul 1986	S. Testa III	
1 Lafayette	Oxford	14 Aug 1988	E.B. Lago	
2 Lafayette	7 mi NW Oxford	11 Jun 1992	P.K. Lago, M.S. Caterino	
1 Lafayette	11 mi NW Oxford	25 Jul 1978	S.E. Hurdle	
1 Lafayette	5 mi NW Oxford	12 Jun 1984	D.F. Stanford.	
1 Lamar	3.5 mi WNW Purvis	20 Jun 1987	P.K. Lago	
2 Lamar	Lumberton	27 Jun 1986	P.K. Lago	
1 Lauderdale	3 mi S Arundel	11 Aug 1986	P.K. Lago	
1 Lawrence		8 Jun 1973	S.G. McDaniel	
1 Leflore	Hwy 8, 0.3 mi W Hwy 49E	9 Apr 1987	C. Busack	
9 Lincoln	3.5 mi SW Brookhaven	26 Apr 1987	S. Testa III	
10 Madison	7.5 mi SE Canton	19 Jun 1986	S. Testa III	
5 Marion	4 mi E Sandy Hook	26 Apr 1997	S. Testa III	
1 Marshall	Holly Springs	11 Jun 1977	S.E. Hurdle	
1 Marshall	Waldoxy St. Pk.	15 Jul 1986	M.C. Beiser	
1 Neshoba	1.5 mi N Dixon	9 May 1979	P.K. Lago	
1 Newton	1 mi N Decatur	13 Aug 1988	P.K. Lago	
3 Noxubee	10 mi W Macon	11 Aug 1987	S. Testa III	
1 Noxubee	Noxubee Natl. W. Refuge	27 May 1989	T.L. Schiefer	mv & bl.light
1 Oktibbeha	Adaton	9 Jan 1981	W.H. Cross	
4 Oktibbeha	Ag. Coll. [MS St. Univ.]		H.E. Weed	
1 Oktibbeha	A & M Coll. [MS St. Univ.]	4 Oct 1930 ?	S.W. Simmons	
1 Oktibbeha	T19N, R15E, Sec. 16	30 May 1991	D.M. Pollock	bl.light
1 Oktibbeha	T19N, R15E, Sec. 35	13 Jun 1990	D.M. Pollock	bl.light
1 Oktibbeha	Starkville	22 Jun 1978	G.L. Snodgrass	
1 Oktibbeha	Starkville	22 Jul 1975	W.H. Cross	
1 Oktibbeha	Union	20 Apr 1939	J.C. Ezelle	
1 Panola	4 mi WSW Pope	8 Aug 1979	W.P. Scott	
1 Pearl River	4.5 mi SSW Silver Run	12 May 1986	S. Testa III	
1 Pike	3 mi N Summit	26 Apr 1987	P.K. Lago	
1 Pontotoc	1 mi SE Ecru	1 Aug 1960	G.L. Snodgrass	
1 Rankin	Cleary 13	13 Jul 1978	W.C. Northern	
1 Stone	Red Ck. X Hwy 15	24 May 1980	P.K. Lago	
2 Stone	Univ. Miss. Forestlands	11-13 May 1986	S. Testa III	
1 Stone	Univ. Miss. Forestlands	9 Apr 1992	P.K. Lago	
39 Sunflower	5 mi SE Indianola	26 Jun 1987	S. Testa III	
2 Tallahatchie	3.5 mi S Charleston	7 Jun 1992	P.K. Lago	bl.light
1 Tishomingo	Tishomingo St. Pk.	8 Jul 1988	S. Testa III	
1 Tishomingo	J.P. Coleman St. Pk.	25 Jun 1984	P.K. Lago	
12 Tunica	5.5 mi W Robinsonville	15 Jul 1978	D.F. Stanford	
6 Walthall	6 mi NE Tylertown	26 Apr 1987	S. Testa III	
1 Warren	8 mi NE Bovina	24 Jun 1981	P.K. Lago	
2 Washington	Stoneville	18 Feb 1983	G. Snodgrass	
7 Wayne	2 mi W Waynesboro	15 Jun 1987	S. Testa III	
1 Wayne	3.5 mi NW State Line	19 May 1983	P.K. Lago	

Appendix 7. *Tropisternus collaris.*

31 Adams	14 mi E. Sibley, Pipe Lake	18 May 1983	P.K. Lago	
1 Adams	Natchez	23 Jun 1982	A.E. Zuccaro Jr.	
4 Adams	Natchez	23 Jul 1982	P.K. Lago	
3 Adams	Natchez	17 May 1983	A.E. Zuccaro Jr.	
9 Amite	Mt.Nebo Lake	25 Jun 1987	S. Testa III	
2 Bolivar	2 mi S Rosedale	20 Jun 1980	P.K. Lago	
6 Bolivar	2 mi S Rosedale	23 Aug 1980	P.K. Lago	
8 Bolivar	2 mi S Rosedale	19 Jun 1986	P.K. Lago	
1 Calhoun	13 mi NE Bruce	6 May 1984	P.K. Lago	
1 Calhoun	13 mi NW Bruce	20 Feb 1981	G.W. Edwards	
1 Calhoun	2 mi SSW Calhoun City	3 Jul 1987	S. Testa III	
1 Calhoun	8 mi S Calhoun City	3 Jul 1987	S. Testa III	
5 Calhoun	Calhoun City	11 Aug 1987	S. Testa III	
13 Calhoun	T11S,R3W, Sec. 25	12 Jul 1978	D.F. Stanford	
14 Carroll	Carrollton	12 Jul 1986	S. Testa III	
3 Choctaw	Ackerman	11 Aug 1987	S. Testa III	
10 Claiborne	1.5 mi SW Port Gibson	26 Jun 1987	S. Testa III	
11 Clarke	1.5 mi N Enterprise	11 Aug 1986	P.K. Lago	
14 Clarke	11 mi WSW Quitman	14 Jun 1987	S. Testa III	
5 Clarke	Clarkco St. Pk.	26 Jun 1984	P.K. Lago	
3 Clay	0.75mi. W Montpelier	6 Nov 1987	S. Testa III	
2 De Soto	8 mi WSW Hernando	1 Aug 1987	S. Testa III	
6 De Soto	Southaven	5 Jun 1987	S. Testa III	
3 Forrest	2.5 mi NW Fruitland Park	21 May 1987	S. Testa III	
28 Forrest	P. B. Johnson St. Pk.	23 Jun 1986	S. Testa III, P.K. Lago	
2 Franklin	7 mi SW Meadville	5 Sep 1981	P.K. Lago	
1 Franklin	7 mi SW Meadville	25 May 1980	P.K. Lago	
1 Franklin	Sardis	28 Apr 1972	W.A. Jones	
3 George	12 mi SW Lucedale, Pascagoula W.M.A.	10 Apr 1992	P.K. Lago	
3 George	12 mi SW Lucedale	21 May 1983	P.K. Lago	
16 George	12 mi SW Lucedale	30 Jun 1986	P.K. Lago	
16 George	12 mi SW Lucedale	19 May 1987	S. Testa III, P.K. Lago	
8 George	3 mi SSW Benndale	24 May 1980	P.K. Lago	
1 George	4.5 mi NNW Lucedale, & T1S, R6W, Sec. 6E	12 Mar 1991	T.L. Schiefer	in pond
6 George	0.5 mi SW Lucedale	26 May 1987	P.K. Lago	
7 George	7 mi S Benndale	11 Apr 1981	P.K. Lago	
2 Greene	3 mi E Sand Hill	27 Jun 1984	P.K. Lago	
1 Greene	4 mi W State Line	27 Jun 1984	P.K. Lago	
10 Grenada	Grenada Lake, Dam Area	12 Jul 1986	S. Testa III	
1 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	10 May 1991	T.L. Schiefer	bl.light
2 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	21-23 May 1991	T.L. Schiefer	bl.light on sandbar
1 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	5-11 Jun 1991	T.L. Schiefer	mv & bl.light
2 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	17-23 Jul 1991	T.L. Schiefer	bl.light
10 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	27 Jul 1991	S. Testa III	
1 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	7 Aug 1991	J.R. McDonald	bl.light
4 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	28 Aug-3 Sep 1991	T.L. Schiefer	bl.light
3 Grenada	T22N,R3E, Sec. 31NW	18 Jun 1990	T.L. Schiefer	bl.light
3 Hancock	2 mi N Waveland Bayou LaCroix	23 May 1982	W.H. Cross	

No.	County	Site	Date	Collector	Other Data
1	Hancock	Point Clear Island	14 Feb 1987	S. Testa III	artesian pond
1	Hancock	Point Clear Island	28 Feb 1987	S. Testa III	artesian pond
4	Hancock	Point Clear Island	24 Apr 1987	S. Testa III	artesian pond
3	Hancock	Point Clear Island	9 May 1986	S. Testa III	bl.light
1	Hancock	Point Clear Island	20 May 1987	S. Testa III	artesian pond
5	Hancock	Point Clear Island	23 Jun 1987	S. Testa III	artesian pond
6	Hancock	Point Clear Island	23 Jun 1987	S. Testa III	bl.light
8	Hancock	Point Clear Island	15 Aug 1986	S. Testa III	bl.light
3	Hancock	Point Clear Island	23 Oct 1986	S. Testa III	artesian pond
1	Hancock	Buccaneer St. Pk.	29 Jun 1984	P.K. Lago	
3	Hancock	Stennis Space Center	22 Mar 1991	P.K. Lago	
5	Hancock	Stennis Space Center	25 Jun 1991	P.K. Lago	
3	Harrison	4.5 mi WSW Lizana, Wolf River	11 Apr 1992	P.K. Lago	
8	Harrison	8 mi NE Saucier	11 Aug 1988	P.K. Lago	
1	Harrison	1.5 mi ESE Saucier	27 Feb 1988	P.K. Lago	
15	Harrison	2 mi N Lyman	25 May 1980	P.K. Lago	
1	Harrison	3.5 mi NE Saucier	18 Oct 1984	P.K. Lago	
1	Harrison	4.5 mi NW Long Beach	11 Aug 1988	S. Testa III	
2	Harrison	5 mi NE Saucier	14 May 1984	P.K. Lago	
3	Harrison	8 mi E Saucier	11 Aug 1988	S. Testa III	
1	Hinds	Bolton	12 Aug 1979	W.C. Mather	
4	Holmes	Holmes Co. St. Pk.	1 Jul 1986	P.K. Lago	
8	Issaquena	0.7 mi S Valley Park	26 Jun 1987	S. Testa III	
4	Issaquena	Valley Park	26 Jun 1987	S. Testa III	
1	Issaquena	2 mi SW Shipland	20 Jun 1992	P.K. Lago	
1	Jackson	Lower Escatawpa River	21 Aug 1991	R. Overstreet	
2	Jackson	11 mi NW Van Cleave	25 May 1987	S. Testa III	
1	Jackson	Escatawpa Riv.I 10	21 Apr 1990	A. Houston	
1	Jackson	Gulf Is. Natl. Seashore Jackson Horn Island	3-6 Jun 1984	R. Brown et al. (Richmond, 1962)	
2	Jackson	Ocean Springs	12-14 Aug 1977	S.E. Hurdle	
2	Jasper	4 mi S. Heidelberg	14 Jun 1987	S. Testa III	
8	Jasper	6 mi NW Montrose	7 May 1980	P.K. Lago	
4	Jefferson	4.5 mi S. Fayette	25 Jun 1987	S. Testa III	
4	Jeff. Davis		18 Jul 1973	J.R. McCoy	
3	Jeff. Davis		2 Jun 1973	J.R. McCoy	
2	Jeff. Davis		27-28 Jun1973	J.R. McCoy	
4	Jones	Lake Bogue Homa	11 Aug 1986	P.K. Lago	
3	Kemper	2 mi N Scooba, T12N,R18E, Sec. 29,30	18 Aug 1991	T.L. Schiefer	bl.light
2	Kemper	3mi N Scooba, T12N, R18E, Sec. 19SE	3 Oct 1991	T.L. Schiefer	bl.light
2	Lafayette	4.5 mi SW Abbeville	30 May 1986	P.K. Lago	
1	Lafayette	Oxford	6 Apr 1978	SC. Elliot	
1	Lafayette	Oxford	8 Apr 1977	M.J. Chapman	
2	Lafayette	Oxford	18 Apr 1981	P.K. Lago	
2	Lafayette	Oxford	22 Apr 1978	SC. Elliot	
1	Lafayette	Oxford	5 May 1973	K. Benjamin	
1	Lafayette	Oxford	5 May 1991	P.K. Lago	
1	Lafayette	Oxford	7 May 1978	P.K. Lago	
1	Lafayette	Oxford	16 May1977	P.K. Lago	
3	Lafayette	Oxford	19 May 1982	P.K. Lago	
2	Lafayette	Oxford	21-25 May 1989	P.K. Lago	
1	Lafayette	Oxford	23 May 1978	D.F. Stanford	
5	Lafayette	Oxford	27-28 May 1982	P.K. Lago	
6	Lafayette	Oxford	29-30 May 1977	P.K. Lago	
1	Lafayette	Oxford	7 Jun 1982	P.K. Lago	
6	Lafayette	Oxford	11 Jun 1981	P.K. Lago	
14	Lafayette	Oxford	11-16 Jun 1978	P.K. Lago, D.F. Stanford	
3	Lafayette	Oxford	15 Jun 1980	P.K. Lago	
2	Lafayette	Oxford	15 Jun 1986	S. Testa III	
1	Lafayette	Oxford	30 Jun 1983	P.K. Lago	
2	Lafayette	Oxford	25-27 Jun1977	P.K. Lago	
4	Lafayette	Oxford	28-29 Jun 1978	D.F. Stanford, M.D. Mann	
1	Lafayette	Oxford	30 Jun 1983	P.K. Lago	
3	Lafayette	Oxford	5 Jul 1978	D.F. Stanford	
14	Lafayette	Oxford	9 Jul 1979	G.W. Edwards	
3	Lafayette	Oxford	15-20 Jul 1986	S. Testa III, P.K. Lago	
1	Lafayette	Oxford	16 Jul 1988	S. Testa III	
2	Lafayette	Oxford	23 Jul 1982	P.K. Lago	
1	Lafayette	Oxford	28 Jul 1979	P.K. Lago	
1	Lafayette	Oxford	1 Aug 1978	P.K. Lago	
2	Lafayette	Oxford	2 Aug 1982	P.K. Lago	
1	Lafayette	Oxford	14 Aug 1988	E.B. Lago	
1	Lafayette	Oxford	23 Aug 1982	P.K. Lago	
5	Lafayette	Oxford	23 Aug 1981	P.K. Lago	
1	Lafayette	Oxford	10 Sep 1982	P.K. Lago	
2	Lafayette	1.5 mi SE Oxford	19 Apr 1979	A. Johnson	
2	Lafayette	5 mi NW Oxford	12 Jun 1984	D.F. Stanford	
1	Lafayette	5 mi NW Oxford	1 Jul 1984	D.F. Stanford	
1	Lafayette	5 mi NW Oxford	10 Jul 1984	D.F. Stanford	
1	Lafayette	5 mi NW Oxford	20 Aug 1984	D.F. Stanford	
2	Lafayette	5 mi NW Oxford	14 Apr 1987	S. Testa III	
2	Lafayette	5 mi E Oxford	27 Aug 1977	D.F. Stanford	
3	Lafayette	5 mi E Oxford	18-20 Jun 1977	D.F. Stanford	
12	Lafayette	6 mi ENE Oxford	15 Jul 1986	S. Testa III	
3	Lafayette	7 mi W Oxford	29 May 1982	P.K. Lago	
1	Lafayette	7 mi NW Oxford	6 May 1984	D.F. Stanford	
1	Lafayette	7 mi NW Oxford	18 Jul 1984	P.K. Lago	
1	Lafayette	7 mi NW Oxford	11 Jun 1992	P.K. Lago	
2	Lafayette	7 mi NW Oxford	30 Sep 1987	M. Purvis	
1	Lafayette	8 mi NE Oxford	3 Sep 1991	M. C. Roberson	
5	Lafayette	8 mi NE Oxford	15 Jul 1986	P.K. Lago	
5	Lafayette	8 mi NE Oxford	17 Sep 1987	S. Testa III, M. Purvis	
2	Lafayette	9 mi NE Oxford	27 Feb 1981	W.C. Northern	
2	Lafayette	10 mi N Oxford	1 Nov 1987	N.E. Warren	
1	Lafayette	11 mi NE Oxford	8 Feb 1976	J. Burris	
1	Lafayette	11 mi NW Oxford	25 Jul 1978	S.E. Hurdle	
3	Lafayette	11 mi NW Oxford	24 Oct 1978	R.W. Goodwin	
1	Lafayette	T7S,R2W, Sec. 34	20 Jun 1978	D.F. Stanford	
6	Lafayette	T7S,R4W, Sec. 24	17 Jul 1978	D.F. Stanford	
8	Lafayette	T9S,R3W, Sec. 19	18 Jul 1978	D.F. Stanford	
50	Lamar	3.5 mi WNW Purvis	20 Jun 1987	P.K. Lago	
2	Lamar	3.5 mi NNE Baxterville	27 Jun 1987	S. Testa III	
34	Lamar	5 mi N Baxterville	9 Apr 1981	P.K. Lago	
1	Lamar	5 mi N Baxterville	19 Apr 1979	P.K. Lago	
8	Lamar	Lumberton	27 Jun 1986	P.K. Lago	
6	Lauderdale	1.5 mi SSE Collinsville	11 Aug 1986	P.K. Lago	
26	Lauderdale	3 mi S Arundel	11 Aug 1986	P.K. Lago	
1	Leflore	1.5 mi NW Itta Bena	26 Jun 1987	S. Testa III	
3	Lincoln	3.5 mi SW Brookhaven	26 Apr 1987	S. Testa III	
5	Lowndes	2.5 mi W Columbus	11 Aug 1987	S. Testa III	
	Lowndes	Lake Lowndes St. Pk.	23 Jun 1981	P.K. Lago	
12	Lowndes	T17N,R16E, Sec. 34	3 Jun 1991	D.M. Pollock	bl.light
1	Lowndes	T17N,R16E, Sec. 34	19 Jul 1990	D.M. Pollock	bl.light
9	Lowndes	T17N,R16E, Sec. 34	19 Jun 1991	D.M. Pollock	bl.light
2	Lowndes	T17N,R16E, Sec.34	7 Jul 1991	D.M. Pollock	bl.light
1	Lowndes	T17N,R16E, Sec. 34	1 Oct 1991	D.M. Pollock	bl.light
1	Lowndes	Tombigbee River, T17N,R19E, Sec. 28	19 Jun 1990	T.L. Schiefer	sandy island
20	Madison	10 mi NE Canton	6 May 1980	P.K. Lago	
7	Madison	7.5 mi SE Canton	19 Jun 1987	S. Testa III	
2	Madison	R. Barnett Res. NE Jackson	15 Mar 1985	F.N. Young	
1	Marion	Lake Columbia	27 Jun 1986	S. Testa III	
6	Marshall	T3S-R3W, Sec.13	10 Jun 1977	S.E. Hurdle	
2	Marshall	T4S,R3W, Sec. 12	2 Jul 1978	D.F. Stanford	
1	Marshall	T4S-R3W, Sec.12	2 Aug 1978	S.E. Hurdle	
1	Marshall	Wall Doxey St. Pk.	30 May 1986	S. Testa III	
96	Marshall	Wall Doxey St. Pk.	30 Jul 1986	S. Testa III	
1	Montgomery	7 mi E Duck Hill	12 Jul 1986	S. Testa III	
3	Neshoba	1.5 mi N Dixon	9 May 1979	P.K. Lago, S. Testa III	
1	Neshoba	10.5 mi NW Philadelphia	11 Aug 1986	S. Testa III	
3	Newton	4 mi E Newton	10 May 1979	P.K. Lago	
1	Newton	4.5 mi E Newton	10 May 1978	P.K. Lago	
8	Newton	6 mi SE Newton	10 May 1978	P.K. Lago	
2	Noxubee	10 mi W Macon	11 Aug 1987	S. Testa III	
1	Noxubee	Noxubee Natl. W. Refuge	27 May 1989	T.L. Schiefer	mv & bl.light
1	Noxubee	Noxubee Natl. W. Refuge	16 Aug 1984	S. Cho	
18	Oktibbeha	Adaton	3-9 Jun 1981	W.H. Cross	
1	Oktibbeha	Embry	30 Mar 1939	R.W. Craig	
1	Oktibbeha	Embry	6 May 1939	B. Miles	
1	Oktibbeha	Etta	22 Apr 1939	J.C. Montgomery	
4	Oktibbeha	Longview	27 Aug 1984	P.R. Miller	
1	Oktibbeha	Starkville	14 Apr 1982	P.R. Miller	
1	Oktibbeha	Starkville	18 Apr 1981	W.H. Cross	
3	Oktibbeha	Starkville	25-29 Apr 1975	W.H. Cross	
1	Oktibbeha	Starkville	5-6 May 1982	W.H. Cross	
1	Oktibbeha	Starkville	8 May 1975	W.H. Cross	
1	Oktibbeha	Starkville	15 May 1982	W.H. Cross	
1	Oktibbeha	Starkville	30 May 1982	W.H. Cross	
2	Oktibbeha	Starkville	30 May 1975	W.H. Cross	
1	Oktibbeha	Starkville	1 Jun 1982	W.H. Cross	
1	Oktibbeha	Starkville	3 Jun 1975	W.H. Cross	
6	Oktibbeha	Starkville	7-13 Jun 1975	W.H. Cross	
1	Oktibbeha	Starkville	23 Jun 1975	W.H. Cross	
1	Oktibbeha	Starkville	26 Jun 1985	Guy Head	
3	Oktibbeha	Starkville	28 Jun 1977	W.H. Cross	
1	Oktibbeha	Starkville	4 Jul 1980	W.H. Cross	
2	Oktibbeha	Starkville	14-17 Jul 1975	W.H. Cross	
1	Oktibbeha	Starkville	22 Jul 1975	W.H. Cross	
2	Oktibbeha	Starkville	15 Aug 1975	W.H. Cross	
2	Oktibbeha	Starkville	17-22 Jul 1981	W.H. Cross	
1	Oktibbeha	Starkville	26 Jul 1981	W.H. Cross	
1	Oktibbeha	Starkville	21 Aug 1981	W.H. Cross	
2	Oktibbeha	Starkville	11 Aug 1981	W.H. Cross	
1	Oktibbeha	Starkville	10 Sep 1988	D. Cross	pond #7
3	Oktibbeha	Starkville	19-20 Sep 1975	W.H. Cross	
1	Oktibbeha	State Coll. [MS St Univ]	23 Apr 1973	L.W. Hepner	
2	Oktibbeha	State Coll. [MS St Univ]	10-16 Apr 1939	G.C. Duckworth, T. Gaines	
2	Oktibbeha	State Coll. [MS St Univ]	25 Apr 1939	L. Fuller, W.T. Black	
2	Oktibbeha	State Coll. [MS St Univ]	27-28 Apr 1939	L. Hinton, H.N. Thomas	
1	Oktibbeha	State Coll. [MS St Univ]	30 Apr 1939	L.L. Tuck	
2	Oktibbeha	State Coll. [MS St Univ]	1 May 1939	S.D. Stringer, D. Thornton	
2	Oktibbeha	State Coll. [MS St Univ]	1 May 1939	D. Naugher, K. O'Kelley	
1	Oktibbeha	State Coll. [MS St Univ]	2 May 1940	W.D. Vail	
2	Oktibbeha	State Coll. [MS St Univ]	3-5 May 1939	J.R. Thompson, R. Craig	
1	Oktibbeha	State Coll. [MS St Univ]	4 Jun 1973	L.W. Hepner	
1	Oktibbeha	State Coll. [MS St Univ]	10 Jun 1939	J.L. Gaines	
3	Oktibbeha	Agri. Coll. [MS St. Univ.]	30 Jun 1909	P.F. Newell	
1	Oktibbeha	State Coll. [MS St Univ]	15 Oct 1974	G. Snodgrass	
39	Oktibbeha	Agri. Coll. [MS St. Univ.]	Oct 1895	H.E. Weed	
2	Oktibbeha	MS State Univ-Hwy 82	31 May 1973	C. Bryson	
1	Oktibbeha	MS State Univ-Hwy 82	6 Jun 1964	J.R. McCoy	
1	Oktibbeha	6 mi SW Starkville	11 Jun 1984	R.L. & B. Brown	
1	Oktibbeha	MS State Univ-Hwy 82	5 Sep 1982	S. MacDonald	
1	Oktibbeha	T19N,R15E, Sec. 16	7 Apr 1991	D.M. Pollock	bl.light
3	Oktibbeha	T19N,R15E, Sec. 16	16 May 1991	D.M. Pollock	bl.light
1	Oktibbeha	T19N,R15E, Sec. 16	30 May 1991	D.M. Pollock	bl.light
2	Oktibbeha	T19N,R15E, Sec. 16	15 Jul 1991	D.M. Pollock	bl.light
1	Oktibbeha	T19N,R15E, Sec. 35	13 Jun 1990	D.M. Pollock	bl.light
3	Panola	4 mi ENE Como	6 Jul 1979	W.P. Scott	
13	Pearl River	1 mi SW Silver Run	12 May 1986	P.K. Lago	
9	Perry	Lake Perry	28 Jun 1987	S. Testa III	
4	Pike	5.5 mi WSW McComb	25 Jun 1987	P.K. Lago	
1	Pontotoc	1 mi SE Ecru	8 May 1980	P.R. Miller	
1	Pontotoc	1 mi SE Ecru	18 Jun 1980	W.H. Cross	
4	Pontotoc	1 mi SE Ecru	2-3 Jul 1980	W.H. Cross	
1	Pontotoc	1 mi SE Ecru	17 Jul 1980	W.H. Cross	
5	Pontotoc	1 mi SE Ecru	31 Jul 1980	W.H. Cross	
1	Pontotoc	1 mi SE Ecru	28 Aug 1980	W.H. Cross	
2	Scott	Golden Mem. St. Pk.	28 Feb 1985	P.K. Lago	
2	Scott	Golden Mem. St. Pk.	8 May 1979	P.K. Lago	
5	Simpson	2 mi W Pinola	24 Jun 1982	B.P. Stark	
2	Simpson	4 mi SE Pinola	13 May 1985	B.P. Stark	
1	Simpson	Tanyard Ck. X Hwy 28	24 May 1980	B.P. Stark	
2	Smith	1 mi N Raleigh	14-15 Jun 1985	R.L. Brown	
2	Smith	Mize	28 Feb 1988	S. Testa III	
1	Stone	13 mi SE Wiggins	10 Apr 1981	P.K. Lago	

No.	County	Site	Date	Collector	Other Data
1	Stone	13 mi SE Wiggins	8 May 1986	P.K. Lago	
2	Stone	4 mi NW McHenry	25 May 1987	S. Testa III	
5	Stone	Red Ck. X Hwy 15	8-9 May 1986	P.K. Lago, S. Testa III	
10	Stone	Red Ck. X Hwy 15	18 May 1987	P.K. Lago	
1	Stone	Red Ck. X Hwy 15	24 May 1980	P.K. Lago	
2	Stone	Red Ck., T3S,R10W, Sec.24	26 Jun 1987	S. Testa III	
7	Stone	Univ. Miss. Forestlands	9-11 Apr 1992	P.K. Lago	
1	Stone	Univ. Miss. Forestlands	23 Apr 1987	P.K. Lago	
1	Stone	Univ. Miss. Forestlands	7 May 1987	P.K. Lago	
4	Stone	Univ. Miss. Forestlands	13 May 1986	S. Testa III	
3	Stone	Univ. Miss. Forestlands	18 May 1987	P.K. Lago	
12	Stone	Univ. Miss. Forestlands	18-19 May 1978	S.C. Elliot, P.K. Lago	
10	Stone	Univ. Miss. Forestlands	10 Jul 1984	S.C. Elliot	
2	Stone	Univ. Miss. Forestlands	11 Aug 1983	P.K. Lago	
1	Stone	Univ. Miss. Forestlands	19 Oct 1984	P.K. Lago	
1	Sunflower	5 mi SE Indianola	26 Jun 1987	P.K. Lago	
3	Tallahatchie	8 mi ESE Charleston	14 Apr 1992	M.S. Caterino	
3	Tippah	Blue Mountain	18 Aug 1987	S. Testa III	
2	Tishomingo	5 mi E Tishomingo	9 Jun 1984	P.K. Lago	
1	Tishomingo	T6S,R11E, Sec.30	22 Jul 1975	P.K. Lago	
1	Tishomingo	Tishomingo St. Pk.	6 Jun 1992	P.K. Lago	bl.light
1	Tishomingo	Tishomingo St. Pk.	9 Jun 1984	P.K. Lago	
1	Tishomingo	Tishomingo St. Pk.	17 Jun 1986	S. Testa III	
6	Tishomingo	Tishomingo St. Pk.	22 Jun 1978	P.K. Lago, S.E. Hurdle	
1	Tishomingo	Tishomingo St. Pk.	8 Jul 1988	S. Testa III	
2	Tishomingo	Tishomingo St. Pk.	22 Jul 1978	D.F. Stanford, P.K. Lago	
1	Tishomingo	Tishomingo St. Pk.	28 Jul 1983	S. Sibley	
6	Tishomingo	Tishomingo St. Pk.	29-30 Jul 1977	S.E. Hurdle	
13	Tishomingo	Tishomingo St. Pk.	8 Sep 1980	P.K. Lago	
1	Tunica	5 mi W Robinsonville	15 Jul 1978	D.F. Stanford	
1	Union	10 mi W New Albany	18 Jul 1986	P.K. Lago	
1	Washington	Greenville	early June 1982	G. Snodgrass	
9	Wayne	3.5 mi NW State Line	19 May 1983	P.K. Lago	
7	Wayne	2 mi W Waynesboro	15 Jun 1987	S. Testa III	
3	Webster	2 mi SE Cumberland, T20N, R12E, Sec. 17	12 Jun 1990	T.L. Schiefer	bl.light
2	Webster	Walthall	11 Aug 1987	S. Testa III	
3	Wilkinson	Buffalo Riv. X Hwy 61	24 Jun 1984	P.K. Lago	
6	Yalobusha	5 mi SW Coffeeville	17 Jul 1986	P.K. Lago	
6	Yazoo	1 mi W Bentonia	19 Jun 1987	S. Testa III	

Appendix 8. *Tropisternus lateralis nimbatus.*

No.	County	Site	Date	Collector	Other Data
1	Adams	Natchez	25 Jun 1987	A.E. Zuccaro Jr.	
1	Alcorn	9 mi S Kossuth	18 Aug 1987	S. Testa III	
44	Bolivar	2 mi W Rosedale	19 Jun 1986	S. Testa III	
2	Bolivar	2 mi W Rosedale	20 Jun 1980	P.K. Lago	
2	Bolivar	2 mi W Rosedale	23 Aug 1980	P.K. Lago	
1	Bolivar	2 mi W Rosedale	7 Oct 1983	P.K. Lago	
1	Bolivar	2 mi W Rosedale	10 Oct 1980	P.K. Lago	
1	Bolivar	2 mi S Rosedale	3 Nov 1980	P.K. Lago	
1	Bolivar	Benoit	24 Jun 1988	K. Knighten	
25	Bolivar	Gr. River Rd. St. Pk.	19 Jun 1986	S. Testa III	
8	Calhoun	T11S,R3W, Sec. 25	12 Jul 1978	D.F. Stanford	
4	Carroll	Carrollton	12 Jul 1936	S. Testa III	
2	Chickasaw	4 mi S Houston	3 Jul 1987	S. Testa III	
1	Choctaw	Ackerman	11 Aug 1987	S. Testa III	
1	Claiborne	1.5 mi SW Port Gibson	26 Jun 1987	S. Testa III	
1	Clarke	1.5 mi N Enterprise	11 Aug 1986	P.K. Lago	
1	Clarke	11 mi WSW Quitman	14 Jun 1987	S. Testa III	
12	Clay	0.7 mi W Montpelier	6 Nov 1987	S. Testa III	
2	Clay	Montpelier	6 Nov 1987	S. Testa III	
1	Clay	T16S, R6E, Sec. 20SE, Black Belt Prairie	13 May 1991	D. Pollock	bl.light
4	Forrest	2.5 mi NW Fruitland Pk.	21 May 1987	S. Testa III	
2	Forrest	P. B. Johnson St. Pk.	23 Jun 1986	P.K. Lago	
2	Franklin	7 mi SW Meadville	5 Sep 1981	P.K. Lago	
1	George	12 mi SW Lucedale	19 May 1987	P.K. Lago	
3	George	3 mi SSW Benndale	24 May 1980	P.K. Lago	
2	Greene	6 mi SE McLain	27 May 1987	S. Testa III	
2	Grenada	Grenada Lake Dam Area	4 May 1985	P.K. Lago	
2	Grenada	Grenada Lake Dam Area	4 Jun 1982	P.K. Lago	
22	Grenada	Grenada Lake Dam Area	12 Jul 1986	S. Testa III	
1	Grenada	Grenada Lake Dam Area	14 Aug 1987	S. Testa III	
1	Grenada	T21N,R3E, Sec. 7SW	18 Jun 1990	T.L. Schiefer	bl.light
2	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	5-11 Jun 1991	T.L. Schiefer	mv & bl.light
6	Hancock	1 mi SSW Lakeshore	12 Aug 1986	P.K. Lago	bl.light
2	Hancock	2 mi N Waveland Bayou LaCroix	23 May 1982	W.H. Cross	
1	Hancock	Buccaneer St. Pk.	29 Jun 1984	P.K. Lago	
20	Hancock	Point Clear Island	14 Feb 1987	P.K. Lago	artesian pond
11	Hancock	Point Clear Island	28 Feb 1987	P.K. Lago	brackish pond (3.5 0/00)
4	Hancock	Point Clear Island	28 Feb 1987	P.K. Lago	brackish pond (6 0/00)
7	Hancock	Point Clear Island	28 Feb 1987	P.K. Lago	artesian pond
14	Hancock	Point Clear Island	24 Apr 1987	P.K. Lago	artesian pond
2	Hancock	Point Clear Island	24 Apr 1987	P.K. Lago	brackish pond (6 0/00)
2	Hancock	Point Clear Island	20 May 1987	P.K. Lago	artesian pond
2	Hancock	Point Clear Island	23 Jun 1987	P.K. Lago	artesian pond
6	Hancock	Point Clear Island	12-15 Aug 1986	P.K. Lago	bl.light
1	Hancock	Point Clear Island	23 Oct 1986	P.K. Lago	artesian pond
1	Hancock	Point Clear Island	27 Sep 1985	P.K. Lago	
1	Harrison	13 mi E Saucier	27 Feb 1988	P.K. Lago	
1	Harrison	2 mi N Lyman	25 May 1980	P.K. Lago	
1	Harrison	3.5 mi NE Saucier	13 May 1984	P.K. Lago	
3	Harrison	4.5 mi NNW Lyman	27 Feb 1988	S. Testa III	
12	Harrison	5 mi NW De Lisle	26 Feb 1988	S. Testa III	
6	Harrison	T5S,R12W, Sec.24	27 Feb 1988	S. Testa III	
1	Hinds	4.5 mi NW Clinton	19 May 1979	P.D. Hartfield	
1	Hinds	Bolton	12 Aug 1979	W.C. Northern	
1	Holmes	Holmes Co. St. Pk.	1 Jul 1986	P.K. Lago	
8	Humphreys	10 mi SW Belzoni	26 Jun 1987	S. Testa III	
4	Humphreys	4 mi SW Belzoni	26 Jun 1987	S. Testa III	
6	Issaquena	0.7 mi S Valley Park	26 Jun 1987	S. Testa III	
6	Jackson	3 mi E Ocean Springs	22 May 1983	P.K. Lago	
2	Jackson	Horn Island	12 May 1986	P.K. Lago	
	Jackson	Horn Island		(Richmond, 1962)	
3	Jackson	Ocean Springs	13 May 1984	P.K. Lago	
2	Jackson	Ocean Springs	1 Jun 1984	A. Lawler	
1	Jefferson	4.5 mi S Fayette	25 Jun 1987	S. Testa III	
6	Jeff. Davis		2 Jul 1973	J.R. McCoy	
5	Jeff. Davis		21 Jun 1973	J.R. McCoy	
4	Jeff. Davis		27-28 Jun 1973	J.R. McCoy	
1	Jones	Sandersville	11 Aug 1986	P.K. Lago	
1	Lafayette	Oxford	26 Jun 1979	D. Massey	
1	Lafayette	Oxford	18 Mar 1977	G. Sparks	
1	Lafayette	Oxford	2 May 1983	P.K. Lago	
1	Lafayette	Oxford	4 May 1977	P.K. Lago	
3	Lafayette	Oxford	11 May 1980	P.K. Lago	
2	Lafayette	Oxford	19 May 1982	P.K. Lago	
3	Lafayette	Oxford	21 May 1979	P.K. Lago	
3	Lafayette	Oxford	26-28 May 1982	P.K. Lago	
3	Lafayette	Oxford	29-30 May 1977	P.K. Lago	
1	Lafayette	Oxford	3 Jun 1989	P.K. Lago	
2	Lafayette	Oxford	4-7 Jun 1982	P.K. Lago	
6	Lafayette	Oxford	7-12 Jun 1978	P.K. Lago, D.F. Stanford	
4	Lafayette	Oxford	15 Jun 1986	S. Testa III	
1	Lafayette	Oxford	28 Jun 1978	D.F. Stanford	
1	Lafayette	Oxford	9 Jul 1979	G.W. Edwards	
1	Lafayette	Oxford	15 Jul 1989	P.K. Lago	
1	Lafayette	Oxford	7 Aug 1978	P.K. Lago	
1	Lafayette	Oxford	14 Aug 1988	S. Testa III	
1	Lafayette	Oxford	30 Aug 1979	P.K. Lago	
1	Lafayette	Oxford	3 Oct 1976	B.Y. Joe	
2	Lafayette	Oxford	20 Oct 1971	M. Kwas	
1	Lafayette	2 mi S Oxford	15 Jan 1977	P.K. Lago	
2	Lafayette	5 mi NW Oxford	31 May 1978	P.K. Lago	
1	Lafayette	5 mi NW Oxford	12 Jun 1984	D.F. Stanford	
3	Lafayette	5 mi S Oxford	9 Apr 1977	R.L. Nolan	
6	Lafayette	6.5 mi NE Oxford	27 Feb 1981	C.M. Sanders	
2	Lafayette	7 mi W Oxford	29 May 1982	P.K. Lago	
3	Lafayette	8 mi NE Oxford	17 Sep 1987	M. Purvis	
6	Lafayette	9 mi NE Oxford	27 Feb 1981	W.C. Northern	
1	Lafayette	11 mi NW Oxford	24 Oct 1978	R.W. Goodwin	
2	Lafayette	11 mi NW Oxford	27 Feb 1982	F.B. Campbell	
2	Lafayette	13.5 mi SE Oxford	9 Oct 1987	P. Pryor	
3	Lafayette	T7S,R2W, Sec. 34	20 Feb 1980	P.K. Lago	
1	Lafayette	T7S,R2W, Sec. 34	27 Feb 1981	F.B. Campbell	
2	Lafayette	T7S,R2W, Sec. 34	20 Jun 1978	D.F. Stanford	
1	Lafayette	T7S,R2W, Sec. 34	31 Jul 1978	S.E. Hurdle	
1	Lafayette	T7S,R2W, Sec. 34	13 Sep 1977	M.K. McEwen	
9	Lamar	3.5 mi WNW Purvis	20 Jun 1987	P.K. Lago	
1	Lamar	5 mi N Baxterville	23 May 1980	P.K. Lago	
11	Lamar	Lumberton	27 Jun 1986	P.K. Lago	
1	Lauderdale	3 mi S Arundel	11 Aug 1986	P.K. Lago	
1	Lee	Mathiston	1 May 1939	C.E. Young	
1	Lee	Tupelo	30 Jun 1969	J.R. Bryson	
1	Leflore	Greenwood	20 Jun 1992	P.K. Lago	
5	Leflore	1.5 mi NW Itta Bena	26 Jun 1987	S. Testa III	
6	Leflore	6 mi WSW Itta Bena	26 Jun 1987	S. Testa III	
2	Lowndes	2.5 mi W Columbus	11 Aug 1987	S. Testa III	
5	Lowndes	Lake Lowndes St. Pk.	23 Jun 1981	P.K. Lago	
6	Madison	10 mi NE Canton	6 May 1980	P.K. Lago	
3	Madison	7.5 mi SE Canton	19 Jun 1987	S. Testa III	
1	Marion	Lake Columbia	21 Apr 1979	P.K. Lago	
4	Marshall	Chewalla Lake	11 Jul 1981	P.K. Lago	
1	Marshall	T3S,R3W, Sec.13	10 Jun 1977	S.E. Hurdle	
2	Marshall	Wall Doxey St. Pk.	21 Feb 1981	M.R. Hammerski	
3	Marshall	Wall Doxey St. Pk.	15 Jun 1986	P.K. Lago	
2	Marshall	Wall Doxey St. Pk.	27 Jun 1986	M.C. Beiser	
2	Marshall	Wall Doxey St. Pk.	30 Jul 1986	S. Testa III	
1	Oktibbeha		11 Jun 64	J.R. McCoy	
2	Oktibbeha		23 May 64	J.R. McCoy	
1	Oktibbeha	Adaton	15 Mar 1982	W.H. Cross	
1	Oktibbeha	Adaton	2 May 1981	W.H. Cross	
7	Oktibbeha	Adaton	3-4 Jun 1981	W.H. Cross	
1	Oktibbeha	Bethel Rd.	29 Jun 1981	S. Clemmer	
1	Oktibbeha	Starkville	22 Apr 1975	W.H. Cross	
3	Oktibbeha	Starkville	1-6 May 1975	W.H. Cross	
1	Oktibbeha	Starkville	8 May 1979	W.H. Cross	
3	Oktibbeha	Starkville	10-14 May 1975	W.H. Cross	
7	Oktibbeha	Starkville	16-19 May 1975	W.H. Cross	
1	Oktibbeha	Starkville	28-31 May 1975	W.H. Cross	
1	Oktibbeha	Starkville	29 May 1976	W.H. Cross	
1	Oktibbeha	Starkville	2 Jun 1980	W.H. Cross	
1	Oktibbeha	Starkville	7 Jun 1975	W.H. Cross	
1	Oktibbeha	Starkville	14 Jun 1975	W.H. Cross	
2	Oktibbeha	Starkville	20 Jun 1985	Guy Head	
1	Oktibbeha	Starkville	17 Aug 1975	W.H. Cross	
1	Oktibbeha	State Coll. [MS St Univ]	9 Jan 1939	T. Pitts	
1	Oktibbeha	State Coll. [MS St Univ]	1 Mar 1939	P.W. Roberts	
1	Oktibbeha	State Coll. [MS St Univ]	29 Mar 1939	R.L. Wells	
1	Oktibbeha	State Coll. [MS St Univ]	27 Apr 1939	P.W. Cowsert	
1	Oktibbeha	State Coll. [MS St Univ]	3 May 1939	J.W. Macon	
31	Oktibbeha	State Coll. [MS St Univ]	10 Jun 1939	L.W. Robinson	
4	Oktibbeha	Agri. Coll. [MS St Univ]	Oct 1895	H.E. Wood	
1	Oktibbeha	MS State Univ.	19 Jun 1969	C. Bryson	
1	Panola	4 mi ENE Como	24 Aug 1979	W.P. Scott	
1	Panola	4 mi WSW Pope	23 Jul 1979	W.P. Scott	
1	Panola	4 mi WSW Pope	10 Aug 1979	W.P. Scott	
1	Panola	Sardis Dam	12 Jun 1979	J. Goddard	
1	Pearl River	1 mi SW Silver Run	12 May 1986	P.K. Lago	
6	Perry	3 mi SW Beaumont	22 May 1987	S. Testa III	
1	Pontotoc	1 mi SE Ecru	24 Apr 1980	P.R. Miller	
1	Pontotoc	1 mi SE Ecru	22 May 1980	W.H. Cross	
2	Pontotoc	1 mi SE Ecru	18 Jun 1980	W.H. Cross	
5	Pontotoc	1 mi SE Ecru	3 Jul 1980	W.H. Cross	
1	Pontotoc	1 mi SE Ecru	17 Jul 1980	W.H. Cross	
1	Pontotoc	1 mi SE Ecru	31 Jul 1980	W.H. Cross	
2	Pontotoc	1 mi SE Ecru	1 Aug 1980	G.L. Snodgrass	
2	Pontotoc	1 mi SE Ecru	14-15 Aug 1980	G. Snodgrass, W.H. Cross	

No. County	Site	Date	Collector	Other Data
8 Quitman	2 mi NE Marks	15 Jul 1978	D.F. Stanford	
14 Quitman	2 mi S Sledge	15 Feb 1979	P.K. Lago	
14 Quitman	2 mi S Sledge	25 Apr 1981	P.K. Lago	
3 Rankin	Ross Barnett Spillway	11 Jun 1987	J. Mason	
2 Scott	3.5 mi SW Forest	28 Feb 1988	P.K. Lago	
7 Scott	Golden Mem. St. Pk.	28 Feb 1988	P.K. Lago	
15 Sharkey	2.5 mi E Anguila	26 Jun 1987	S. Testa III	
4 Sharkey	Rolling Fork	20 Jun 1992	P.K. Lago	
12 Sharkey	Rolling Fork	26 Jun 1987	S. Testa III	
1 Simpson	3 mi WNW D'Lo	1 Jul 1986	P.K. Lago	
1 Simpson	4.5 mi NW Magee	1 Jul 1986	P.K. Lago	
1 Simpson	4.5 mi NW Magee Simpson Legion Lake	23 May 1988	P.K. Lago	
6 Simpson	Tanyard Ck. X Hwy 28	24 May 1980	B.P. Stark	
13 Stone	4 mi NW McHenry	25 May 1987	S. Testa III	
1 Stone	4.5 mi SW Perkinston	28 May 1987	P.K. Lago	
12 Sunflower	5 mi SE Indianola	26 Jun 1987	S. Testa III	
2 Tishomingo	1.5 mi NW Belmont	17 Jun 1986	S. Testa III	
1 Tishomingo	5 mi E Tishomingo	9 Jun 1984	P.K. Lago	
2 Tishomingo	T6S,R11E, Sec. 30	22 Jun 1978	P.K. Lago	
1 Tishomingo	Tishomingo St. Pk.	17 Jun 1986	S. Testa III	
1 Tishomingo	Tishomingo St. Pk.	8 Jul 1988	S. Testa III	
4 Tishomingo	Tishomingo St. Pk.	8 Sep 1980	P.K. Lago	
8 Tunica	5.5 mi W Robinsonville	17 Jun 1978	D.F. Stanford	
3 Walthall	6 mi NE Tylertown	26 Apr 1987	S. Testa III	
1 Washington	Greenville	30 Sep 1982	G. Snodgrass	bl.light
21 Washington	Greenville	early July 1982	G. Snodgrass	bl.light
1 Washington	Leland	25 Oct 1985	C. T. Bryson	
3 Washington	Leland	11 Nov 1985	C. T. Bryson	
5 Washington	Stoneville	12 Jul 1989	J. MacDonald	bl.light
2 Wayne	Waynesboro	19 May 1983	P.K. Lago	
2 Webster	Walthall	11 Aug 1987	S. Testa III	
1 Yalobusha	2 mi SW Coffeeville	30 Jan 1987	S. Testa III	
1 Yalobusha	5 mi SW Coffeeville	17 Jun 1986	P.K. Lago	
1 Yazoo	1 mi W Bentonia	19 Jun 1987	S. Testa III	

Appendix 9. *Tropisternus natator.*

1 Hancock	Point Clear Island	26 Sep 1985	S. Testa III	brackish pond
1 Harrison	1.5 mi ESE Saucier	27 Feb 1988	P.K. Lago	
2 Harrison	12.5 mi E Saucier	25 May 1987	S. Testa III	
1 Lafayette	Oxford	24 Aug 1987	S. Testa III	
1 Lafayette	6 mi ENE Oxford	17 Apr 1980	P.K. Lago	
2 Lafayette	8 mi NE Oxford	21 Apr 1985	R. Moore	
3 Lafayette	9 mi NE Oxford	27 Feb 1981	WC. Northern	
1 Lafayette	11 mi NW Oxford	20 Apr 1979	R. W. Goodwin	
2 Lafayette	T7S,R2W, Sec. 34	9 Jun 1978	D. Stanford, S. Hurdle	
1 Lafayette	T7S,R2W, Sec. 34	17 Apr 1980	P.K. Lago	
1 Lafayette	T8S,R4W, Sec. 5	11 Nov 1977	D. Stanford	
1 Lafayette	1.5 mi NE Abbeville	2 Mar 1979	D. Massey	
1 Lamar	Lumberton	27 Jun 1986	P.K. Lago	
1 Oktibbeha	State Coll. [MS St Univ]	1 May 1939	K.L. O'Kelley	
1 Oktibbeha	State Coll. [MS St Univ]	10 Apr 1941	W.M. Fleming	
2 Simpson	3 mi WNW D'Lo	1 Jul 1986	P.K. Lago	
1 Stone	Univ. Miss. Forestlands	10 Apr 1981	J. Goddard	
1 Stone	Univ. Miss. Forestlands	9 Apr 1992	P.K. Lago	
4 Stone	13 mi SE Wiggins	10 Apr 1981	P.K. Lago	
1 Stone	T3S,R9W, Sec. 17	10 May 1986	S. Testa III	
3 Tishomingo	Tishomingo St. Pk.	28 Jul 1983	S. Sibley	
1 Walthall	Tylertown	26 Apr 1987	P.K. Lago	
2 Webster	Walthall	11 Aug 1987	S. Testa III	

Appendix 10. *Tropisternus quadristriatus.*

4 Hancock	1 mi SSW Lakeshore	23 Jun 1987	P.K. Lago	bl.light
16 Hancock	1 mi SSW Lakeshore	12 Aug 1986	P.K. Lago	bl.light
4 Hancock	2 mi N. Waveland Bayou LaCroix	23 May 1982		
38 Hancock	Point Clear Island	14 Feb 1987	P.K. Lago	artesian pond
27 Hancock	Point Clear Island	14 Feb 1987	P.K. Lago	brackish pond (3.5 0/00)
7 Hancock	Point Clear Island	14 Feb 1987	P.K. Lago	brackish pond (6 0/00)
13 Hancock	Point Clear Island	28 Feb 1987	P.K. Lago	artesian pond
21 Hancock	Point Clear Island	28 Feb 1987	P.K. Lago	brackish pond
5 Hancock	Point Clear Island	24 Apr 1987	P.K. Lago	artesian pond
15 Hancock	Point Clear Island	24 Apr 1987	P.K. Lago	brackish pond (3.5 0/00)
13 Hancock	Point Clear Island	24 Apr 1987	P.K. Lago	brackish pond (8 0/00)
172 Hancock	Point Clear Island	9 May 1986	P.K. Lago	bl.light
2 Hancock	Point Clear Island	20 May 1987	P.K. Lago	artesian pond
13 Hancock	Point Clear Island	23 Jun 1987	P.K. Lago	artesian pond
3 Hancock	Point Clear Island	23 Jun 1987	P.K. Lago	brackish pond
54 Hancock	Point Clear Island	23 Jun 1987	P.K. Lago	bl.light
28 Hancock	Point Clear Island	24 Jun 1986	P.K. Lago	bl.light
52 Hancock	Point Clear Island	15 Aug 1986	P.K. Lago	bl.light
3 Hancock	Point Clear Island	23 Oct 1986	P.K. Lago	artesian pond
3 Harrison	Biloxi	20 May 1978	P.K. Lago	
20 Jackson	Horn Island	12 May 1986	P.K. Lago	large fresh-water pond
Jackson	Horn Island			(Richmond, 1962)
2 Jackson	Ocean Springs	14 Aug 1977	S.E. Hurdle	
1 Jackson	Ocean Springs	12 Aug 1979	S.E. Hurdle	
1 Stone	Univ. Miss. Forestlands	13 May 1986	S. Testa III	
1 Stone	Univ. Miss. Forestlands	18 May 1978	S. C. Elliot	

Appendix 11. *Hydrobiomorpha casta.*

18 Adams	14 mi E Sibley, Pipe Lake	25 Jun 1987	P.K. Lago	
1 Hancock	Point Clear Island	9 May 1986	P.K. Lago	bl.light
Jackson	Horn Island		(Richmond, 1962)	
4 Lamar	3.5 mi NNE Baxterville	27 Jun 1986	S. Testa III	
1 Lamar	3.5mi. WNW Purvis	20 Jun 1987	P.K. Lago	

No. County	Site	Date	Collector	Other Data
1 Neshoba	7 mi SW Philadelphia	9 May 1979	P.K. Lago	
1 Oktibbeha	Adaton	4 Jun 1981	W.H. Cross	

Appendix 12. *Hydrochara brevipalpis.*

1 Forrest	9.5 mi S Brooklyn	23 May 1980	P.K. Lago	
1 Harrison	3.5 mi NE Saucier	14 May 1984	P.K. Lago	
1 Lafayette	Oxford	31 Mar 1977	T. McCraine	
1 Lafayette	Oxford	8 Jul 1969	A.K. Bryson	
1 Lafayette	6 mi ENE Oxford	15 Jul 1986	S. Testa III	
1 Marshall	T4S,R3W, Sec.12	2 Aug 1978	S.E. Hurdle	
1 Stone	13 mi SE Wiggins	10 Apr 1981	P.K. Lago	
1 Stone	Red Ck. X Hwy 15	18 May 1987	P.K. Lago	

Appendix 13. *Hydrochara soror.*

26 Adams	Natchez	25 Jun 1987	A.E. Zuccaro Jr.	store lights
2 Alcorn	15.5 mi W Corinth	18 May 1992	P.K. Lago	bl.light
1 Amite	2.3 mi NE Rosetta Mt. Nebo	25 Jun 1987	P.K. Lago	
1 Amite	Mt. Nebo Lake	25 Jun 1987	S. Testa III	
1 Attala	10 mi SW Sallis	1 Jul 1986	S. Testa III	
2 Attala	8.5 mi SW Sallis	1 Jul 1986	P.K. Lago	
3 Calhoun	T11S,R3W, Sec.25	12 Jul 1978	D.F. Stanford	
1 Franklin	7 mi SW Meadville	28 May 1980	P.K. Lago	
1 Franklin	7 mi SW Meadville	30 May 1988	P.K. Lago	
1 George	12 mi SW Lucedale, Pascagoula W.M.A.	10 Apr 1992	P.K. Lago	
4 George	12 mi SW Lucedale Rines Lakes	19 May 1987	S. Testa III	
20 George	12 mi SW Lucedale	19 May 1987	P.K. Lago	
2 George	12 mi SW Lucedale	21 May 1983	P.K. Lago	
1 Grenada	Grenada	15 Feb 1992	M.S. Caterino	
1 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	12-18 Feb 1992	R.L. Brown	
6 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	10 May 1991	T.L. Schiefer	bl.light
3 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	21 May 1991	J. MacDonald, T. Schiefer	bl.light)
1 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	29 May-4 Jun 1991	R.L. Brown	bl.light
7 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	5 Jun 1991	M.W. MacGown, J.R. MacDonald	mv & bl.light
10 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	18 Jun 1990	T.L. Schiefer	bl.light
1 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	17-23 Jul 1991	T.L. Schiefer	bl.light
28 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	27 Jul 1991	S. Testa III, D. Pollock	mv & bl.light
4 Hancock	Stennis Space Center	22 Mar 1991	P.K. Lago	
2 Hancock	Stennis Space Center	25 Jun 1991	P.K. Lago	
3 Issaquena	2 mi SW Shipland	20 Jun 1992	P.K. Lago	
2 Jackson	3 mi E Ocean Springs	22 May 1983	P.K. Lago	
1 Jasper	4 mi S Heidelberg	14 Jun 1987	S. Testa III	
1 Jefferson	4.5 mi S Fayette	25 Jun 1987	S. Testa III	
1 Kemper	2 mi N Scooba, T12N, R18E, Sec. 29,30	8 Aug 1991	T.L. Schiefer	bl.light
1 Lafayette	Oxford	4 Mar 1987	S. Testa III	
1 Lafayette	Oxford	31 Mar 1986	S. Testa III	
2 Lafayette	Oxford	2-8 Apr 1986	PC. Ge, P.K. Lago	
1 Lafayette	Oxford	27 Apr 1986	S. Testa III	
1 Lafayette	Oxford	6 May 1983	P.K. Lago	
1 Lafayette	Oxford	17 May 1982	P.K. Lago	
2 Lafayette	Oxford	24-30 May 1978	M.O. Mann, D.F. Stanford	
1 Lafayette	Oxford	15 Jun 1986	S. Testa III	
3 Lafayette	Oxford	25 Jun 1977	P.K. Lago	
1 Lafayette	Oxford	29 Jun 1978	M.O. Mann	
1 Lafayette	Oxford	30 Jun 1983	P.K. Lago	
2 Lafayette	Oxford	5 Jul 1978	D.F. Stanford	
2 Lafayette	Oxford	6 Jul 1981	P.K. Lago	
1 Lafayette	Oxford	9 Jul 1979	G.W. Edwards	
2 Lafayette	Oxford	20 Jul 1986	S. Testa III	
1 Lafayette	Oxford	25 Jul 1987	P.K. Lago	
4 Lafayette	5 mi E Oxford	18 Jun 1977	D.F. Stanford	
1 Lafayette	5 mi NW Oxford	10 Jul 1984	D.F. Stanford	
4 Lafayette	6 mi ENE Oxford	15 Jul 1986	S. Testa III	
1 Lafayette	9 mi NW Oxford	28 May 1989	P.K. Lago	
4 Lafayette	T7S,R2W, Sec.35	31 May 1978	P.K. Lago	
1 Lafayette	T7S,R4W, Sec.24	17 Jul 1978	H.L. Schuster	
4 Lamar	3.5 mi NNE Baxterville	27 Jun 1986	S. Testa III	
3 Lamar	6 mi NE Oxford	15 Jul 1986	S. Testa III	
1 Lowndes	T17N,R16E, Sec. 34	19 Jul 1990	D.M. Pollock	bl.light
3 Lowndes	T17N,R16E, Sec. 34	3 Jun 1991	D.M. Pollock	bl.light
1 Marshall	Holly Springs	11 Jun 1979	S.E. Hurdle	
2 Marshall	Wall Doxey St. Pk.	30 May 1986	S. Testa III	
1 Monroe	ca. 5 mi NE Hamilton	26 Apr 1991	D. Pollock	bl.light
1 Montgomery	7 mi E Duck Hill	12 Jul 1986	S. Testa III	
3 Neshoba	1.5 mi N Dixon	9 May 1979	P.K. Lago	
2 Neshoba	7 mi SW Philadelphia	9 May 1979	P.K. Lago	
1 Oktibbeha	Adaton	20 Jun 1973	C. Bryson	
1 Oktibbeha	Adaton	15 Mar 1981	W.H. Cross	
1 Oktibbeha	Ag. Coll [MS St. Univ.]	18 Oct ?	R. Cowart ?	
1 Oktibbeha	MS St. Univ. North Farm	6 Mar 1991	D.M. Pollock	bl.light
1 Oktibbeha	Starkville	22 Mar 1975	W.H. Cross	
1 Oktibbeha	Starkville	2 Apr 1975	W.H. Cross	
1 Oktibbeha	Starkville	4 Apr 1976	W.H. Cross	
1 Oktibbeha	Starkville	4 May 1982	W.H. Cross	
1 Oktibbeha	Starkville	26 May 1982	W.H. Cross	
1 Oktibbeha	Starkville	29 Jun 1975	W.H. Cross	
1 Oktibbeha	T19N,R15E, Sec. 16	9 Mar 1990	D.M. Pollock	bl.light
1 Oktibbeha	T19N,R15E, Sec. 16	7 Apr 1991	D.M. Pollock	bl.light
1 Oktibbeha	T19N,R15E, Sec. 16	27 Apr 1991	D.M. Pollock	bl.light
1 Oktibbeha	T19N,R15E, Sec. 16	16 May 1991	D.M. Pollock	bl.light
1 Pontotoc	1 mi SE Ecru	22 May 1980	P.R. Miller	
1 Scott	Golden Mem. St. Pk	28 Feb 1988	P.K. Lago	
2 Simpson	4 mi SE Pinola	2 Jun 1986	B.P. Stark	
4 Stone	Red Ck. X Hwy 15	18 May 1987	P.K. Lago	

No. County	Site	Date	Collector	Other Data
1 Sunflower	5 mi SE Indianola	26 Jun 1987	S. Testa III	
1 Sunflower	Indianola	20 Jun 1992	P.K. Lago	
2 Tallahatchie	3.5 mi S Charleston	7 Jun 1992	P.K. Lago	bl.light
10 Tippah	2.5 mi WSW Walnut	8 Mar 1993	P.K. Lago	woodland pond
2 Tishomingo	J.P. Coleman St. Pk.	25 Jun 1984	P.K. Lago	
1 Tishomingo	T6S,R11E- Sec.30	22 Jul 1978	P.K. Lago	
3 Tishomingo	Tishomingo St. Pk.	8 Jul 1988	S. Testa III	
1 Tishomingo	Tishomingo St. Pk.	21 Apr 1989	P.K. Lago	
2 Tishomingo	Tishomingo St. Pk.	1 May 1992	P.K. Lago	bl.light
1 Tishomingo	Tishomingo St. Pk.	6 Jun 1992	P.K. Lago	bl.light
1 Union	2 mi NE Etta	12 May 1992	P.K. Lago	bl.light
8 Washington	Stoneville	3 Jul 1982	G. Snodgrass	
3 Washington	Greenville	early July 1982	G. Snodgrass	bl.light
5 Wayne	2 mi W Waynesboro	15 Jun 1987	S. Testa III	
2 Wayne	Waynesboro	19 May 1983	P.K. Lago	

Appendix 14. *Hydrochara spangleri.*

2 Adams	Natchez	27 May 1977	A.E. Zuccaro Jr.	
1 Attala	10 mi SW Sallis	1 Jul 1986	S. Testa III	
1 Bolivar	2 mi W Rosedale	19 Jun 1981	P.K. Lago	
24 Bolivar	2 mi W Rosedale	19 Jun 1986	S Testa III	
1 Bolivar	Scott	22 May 1973		
4 George	12 mi SW Lucedale	19 May 1987	P.K. Lago	
2 George	12 mi SW Lucedale	21 May 1983	P.K. Lago	
1 Hinds	Clinton	19 Mar 1945		
2 Issaquena	2 mi SW Shipland	20 Jun 1992	P.K. Lago	
2 Jeff. Davis		21-27 Jun 1973	J.R. McCoy	
1 Lafayette	7 mi NW Oxford	11 Jun 1992	P.K. Lago	
1 Lafayette	11 mi NE Oxford	20 Apr 1979	R.W. Goodwin	
2 Lafayette	Oxford	19 Apr 1972	F. Williams	
1 Lafayette	Oxford	18 May 1979	M.O. Mann	
2 Lafayette	Oxford	8 Jun 1978	P.K. Lago	
1 Lafayette	Oxford	20 May 1949	H.V. Weems	
8 Lafayette	Oxford	15-16 Jun 1986	S. Testa III	
2 Marshall	Wall Doxey St. Pk.	30 May 1986	S. Testa III	
1 Oktibbeha	Ag. Coll [MS St. Univ.]	12 Jun 1907	P.F. Newell	
1 Oktibbeha	Ag. Coll [MS St. Univ.]	29 Oct 1911	E.C. Crockett	
1 Oktibbeha	Ag. Coll [MS St. Univ.]	Oct 1895	H.E. Hunt	
1 Oktibbeha	Starkville	25 Apr 1975	W.H. Cross	
1 Oktibbeha	Starkville	5 Aug 1918	S.W. Martini	

Appendix 15. *Phaenonotum exstriatum.*

7 Adams	14 mi E Sibley, Pipe Lake	18 May 1983	P.K. Lago	
2 Clarke	Clarkco St. Pk.	26 Jun 1984	P.K. Lago	
1 George	12 mi SW Lucedale	10 Apr 1992	P.K. Lago	
2 Greene	3 mi E Sand Hill	27 Jun 1984	P.K. Lago	
5 Hancock	Stennis Space Center	22 Mar 1991	P.K. Lago	
1 Hancock	Stennis Space Center	25 Jun 1991	P.K. Lago	
1 Hancock	Stennis Space Center	12 Apr 1991	P.K. Lago	
1 Hancock	6 mi WNW Waveland	26 May 1980	P.K. Lago	
1 Harrison	12.5 mi E Saucier	25 May 1987	P.K. Lago	
1 Harrison	Gulfport	3-9 Jul 1938	C.K. Dorney	
1 Jackson	11 mi NW Van Cleave	25 May 1987	S. Testa III	
2 Jackson	3 mi E Ocean Springs	22 May 1983	P.K. Lago	
2 Jackson	Ocean Springs	12 Aug 1977	S.E. Hurdle	
5 Jasper	6 mi NW Montrose	7 May 1980	P.K. Lago	
1 Jones	Lake Bogue Homa	11 Aug 1986	P.K. Lago	
2 Lafayette	7 mi NW Oxford	12 Apr 1991	P.K. Lago	
1 Lafayette	5 mi E Oxford	18 Jun 1977	D.F. Stanford	
1 Lamar	5 mi N Baxterville	19 Apr 1979	P.K. Lago	
1 Lamar	5 mi N Baxterville	23 May 1980	P.K. Lago	
1 Marion	Lake Columbia	27 Jun 1986	S. Testa III	
1 Marshall	Wall Doxey St. Pk.	15 Jul 1986	M.C. Beiser	
1 Marshall	Wall Doxey St. Pk.	30 Jul 1986	S. Testa III	
5 Neshoba	1.5 mi N Dixon	9 May 1979	P.K. Lago	
1 Newton	1 mi N Decatur	13 Aug 1988	P.K. Lago	
4 Newton	6 mi SE Newton	10 May 1979	P.K. Lago	
1 Oktibbeha	Starkville	6 May 1975	W.H. Cross	
2 Oktibbeha	Starkville	16-17 Jul 1975	W.H. Cross	
1 Perry	Lake Perry	28 Jun 1986	S. Testa III	
1 Pontotoc	1 mi SE Ecru	6 Jun 1980	W.H. Cross	
1 Simpson	4 mi SE Pinola	13 May 1985	B.P. Stark	
1 Stone	Univ. Miss. Forestlands	8 May 1986	P.K. Lago	
4 Stone	Univ. Miss. Forestlands	18-20 May 1978	P.K. Lago	
1 Tippah	4 mi N Ripley	18 May 1992	P.K. Lago	bl.light
1 Tishomingo	Tishomingo St. Pk.	1 May 1992	P.K. Lago	bl.light
1 Tishomingo	Tishomingo St. Pk.	6 Jun 1992	P.K. Lago	bl.light
2 Tishomingo	Tishomingo St. Pk.	8 Jul 1986	S. Testa III	
1 Washington	Stoneville	14 Dec 1981	G. Snodgrass	

Appendix 16. *Berosus aculeatus.*

25 Adams	Homochitto Natl. Forest	19 Jun 1974	P.D. Hartfield	
4 Alcorn	15.5 mi W Corinth	18 May 1992	P.K. Lago	bl.light
2 Amite	Mt. Nebo Lake	25 Jun 1987	S. Testa III	
7 Attala	10 mi SW Sallis	1 Jul 1986	S. Testa III	
1 Attala	Kosciusko	10 1988	P.K. Lago	
30 Calhoun	8 mi E Calhoun City	3 Jul 1987	S. Testa III	roots in creek
5 Calhoun	T11S,R2W, Sec.30	12 Jul 1978	D.F. Stanford	
7 Claiborne	Sand Ck. @ waterfall	3 Jun 1986	B.P. Stark	
2 Forrest	5 mi S Brooklyn	24 May 1987	S. Testa III	
3 Forrest	6 mi WSW McLaurin	23 Jun 1986	S. Testa III	
1 Forrest	2.5 mi NW Fruitland Pk.	21 May 1987	S. Testa III	
5 George	12 mi SW Lucedale	19 May 1987	P.K. Lago	
1 George	12 mi SW Lucedale	30 Jun 1986	P.K. Lago	
3 George	3 mi SSW Benndale	24 May 1980	P.K. Lago	
1 Greene	6 mi SE McLain	27 May 1987	S. Testa III	
3 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	28 Aug-3 Sep 1991	T.L. Schiefer	bl.light on sandbar
1 Hancock	4 mi NW Kiln	26 May 1980	P.K. Lago	
1 Hancock	6 mi WNW Waveland	26 May 1980	P.K. Lago	
1 Hancock	Stennis Space Center	25 Jun 1991	P.K. Lago	
4 Harrison	8 mi NE Saucier	11 Aug 1988	P.K. Lago	
1 Harrison	12.5 mi E Saucier	23 May 1987	S. Testa III	
5 Holmes	Holmes Co. St. Pk.	1 Jul 1986	P.K. Lago	
1 Issaquena	Valley Park	26 Jun 1987	S. Testa III	
1 Jackson	11 mi NW Van Cleave	11 May 1986	P.K. Lago	
13 Jackson	4 mi SW Hurley	26 May 1987	S. Testa III	
2 Jeff. Davis		28 Jun - 2 Jul 1973	J.R. McCoy	
2 Jeff. Davis		18 Jul 1973	J.R. McCoy	
1 Kemper	Pawticfaw Ck. X Hwy 39	13 Jun 1987	C. Busack	
1 Lafayette	Oxford	29 Mar 1979	D. Massey	
2 Lafayette	Oxford	12-14 Jun 1978	P.K. Lago	
1 Lafayette	Oxford	9 Jul 1979	G.W. Edwards	
6 Lafayette	Oxford	13 Jul 1978	D.F. Stanford	
1 Lafayette	Oxford	28 Jul 1979	P.K. Lago	
3 Lafayette	5 mi E Oxford	18-20 Jun 1977	D.F. Stanford	
1 Lafayette	6 mi ENE Oxford	15 Jul 1986	S. Testa III	
20 Lafayette	T7S,R2W, Sec.25	25 Jul 1978	P.K. Lago, H. Schuster	
1 Lafayette	T7S,R4W, Sec. 24	14 Jul 1978	S.E. Hurdle	
2 Lamar	3.5 mi WNW Purvis	20 Jun 1987	P.K. Lago	
2 Lamar	4 mi N Baxterville	14 Jun 1979	M. Balthazar	
3 Lamar	5 mi N Baxterville	23 May 1980	P.K. Lago	
1 Lowndes	2.5 mi NNW Artesia	28 Jul 1988	S. Testa III	
1 Lowndes	2.5 mi W Columbus	11 Aug 1987	S. Testa III	
1 Marion	8 mi SE Columbia	27 Jun 1986	P.K. Lago	
1 Marion	Lake Columbia	27 Jun 1986	P.K. Lago	
1 Marshall	T3S,R3W, Sec. 13	10 Jul 1977	S.E. Hurdle	
2 Marshall	Wall Doxey St. Pk.	15 Jul 1986	M.C. Beiser	
12 Marshall	Wall Doxey St. Pk.	30 Jul 1986	S. Testa III	
1 Montgomery	7 mi E Duck Hill	12 Jul 1986	S. Testa III	
1 Neshoba	1.5 mi N Dixon	9 May 1979	P.K. Lago	
19 Noxubee	4 mi N Macon	11 Aug 1987	S. Testa III	
1 Oktibbeha	Adaton	24 May 1982	W.H. Cross	
1 Oktibbeha	Starkville	31 May 1981	P.R. Miller	
1 Oktibbeha	T19N,R15E, Sec.16	21 Apr 1987	T.L. Schiefer	
11 Pike	McComb	26 Apr 1987	S. Testa III	
1 Sharkey	2.5 mi E Anguilla	26 Jun 1987	S. Testa III	
1 Simpson	3.5 mi SSW Mendenhall	30 Aug. 1985	B.P. Stark	
1 Simpson	4.5 mi NW Magee	1 Jul 1986	P.K. Lago	
5 Stone	4 mi NW McHenry	25 May 1987	P.K. Lago	
7 Stone	13 mi SE Wiggins	26 Jun 1986	S. Testa III	
6 Stone	Red Ck. X Hwy 15	9 May 1986	S. Testa III	
18 Stone	T3S,R10W, Sec. 24	26 Jun 1986	S. Testa III	
1 Stone	Univ. Miss. Forestlands	7 May 1987	P.K. Lago	
1 Stone	Univ. Miss. Forestlands	18 May 1987	P.K. Lago	
2 Stone	Univ. Miss. Forestlands	22-24 May 1980	P.K. Lago	
1 Stone	Univ. Miss. Forestlands	29 Jun 1986	P.K. Lago	
9 Stone	Univ. Miss. Forestlands	11 Aug 1988	P.K. Lago	
1 Tishomingo	J.P. Coleman St. Pk.	25 Jun 1984	P.K. Lago	
2 Tishomingo	Tishomingo St. Pk.	6 Jun 1992	P.K. Lago	bl.light
2 Tishomingo	Tishomingo St. Pk.	21-22 Jul 1978	S.E. Hurdle, P.K. Lago	
1 Tishomingo	Tishomingo St. Pk.	28 Jul 1983	S.Sibley	
3 Union	12.5 mi W New Albany	28 Jul 1986	P.K. Lago	
1 Walthall	5 mi SE Lexis	16 Jun 1977	B.P. Stark	
7 Walthall	6 mi NE Tylertown	26 Apr 1987	S. Testa III	
2 Wayne	2 mi W Waynesboro	15 Jun 1987	S. Testa III	
1 Webster	5 mi NW Walthall	11 Aug 1987	S. Testa III	
5 Webster	Walthall	11 Aug 1987	S. Testa III	
7 Wilkinson	Buffalo Riv. X Hwy 61	24 Jun 1982	P.K. Lago	

Appendix 17. *Berosus corrini.*

1 Lamar	5 mi N Baxterville	23 May 1980	P.K. Lago	

Appendix 18. *Berosus exiguus.*

6 Adams	14 mi E Sibley, Pipe Lake	18 May 1983	P.K. Lago	
2 Adams	Natchez	23 Jun 1982	A.E. Zuccaro Jr.	
1 Adams	Natchez	17 May 1983	A.E. Zuccaro Jr. S. Testa III	
6 Alcorn	9 mi E Kossuth			
1 Alcorn	15.5 mi W Corinth	18 May 1992	P.K. Lago	bl.light
2 Bolivar	2 mi W Rosedale	20 Jun 1980	P.K. Lago	
3 Calhoun	T11S,R3W, Sec. 25	12 Jul 1978	S.F. Stanford	
1 Carroll	Carrollton	12 Jul 1966	S. Testa III	
4 Choctaw	Ackerman	11 Aug. 1987	S. Testa III	
1 Clarke	1.5 mi N Enterprise	11 Aug 1986	P.K. Lago	
1 Clarke	Clarkco St. Pk.	26 Jun 1984	P.K. Lago	
1 Forrest	2.5 mi NW Fruitland Pk.	21 May 1987	S. Testa III	
50 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	5 Jun 1991	M.W. MacGown T.L. Schiefer	mv & bl.light
1 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	12-18 Jun 1991	T.L. Schiefer	bl.light
3 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	17-23 Jul 1991	T.L. Schiefer	bl.light
2 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	27 Jul 1991	S. Testa III J.R. MacDonald	bl.light
6 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	7 Aug 1991	J.R. MacDonald, R.L. Brown	bl.light
1 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	14-20 Aug 1991	T.L. Schiefer	bl.light
4 Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	28 Aug-3 Sep 1991	T.L. Schiefer	bl.light on sandbar
24 Grenada	T21N,R3E, Sec.7SW	18 Jun 1990	T.L. Schiefer	bl.light
5 Hancock	1 mi SSW Lakeshore	23 Jun 1987	P.K. Lago	bl.light
7 Hancock	1 mi SSW Lakeshore	12 Aug 1986	P.K. Lago	bl.light
29 Hancock	1.5 mi SW Lakeshore	12 Aug 1986	P.K. Lago	bl.light
5 Hancock	2 mi N Waveland	23 May 1982	W.H. Cross	
11 Hancock	Point Clear Island	14 Feb 1987	P.K. Lago	
32 Hancock	Point Clear Island	9 May 1986	P.K. Lago	bl.light
3 Hancock	Point Clear Island	20 May 1987	P.K. Lago	artesian pond
3 Hancock	Point Clear Island	23 Jun 1987	P.K. Lago	artesian pond
3 Hancock	Point Clear Island	23 Jun 1987	P.K. Lago	brackish pond
45 Hancock	Point Clear Island	24 Jun 1986	P.K. Lago	bl.light
158 Hancock	Point Clear Island	12-15 Aug 1986	P.K. Lago	bl.light
4 Harrison	8 mi NE Saucier	11 Aug 1988	P.K. Lago	
1 Harrison	Biloxi	20 May 1978	P.K. Lago	
14 Hinds	4 mi N Clinton	21 May 1977	B.P. Stark	
1 Hinds	5 mi NW Clinton	19 May 1979	P.D. Hartfield	
5 Holmes	Holmes Co. St. Pk.	1 Jul 1986	P.K. Lago	

No.	County	Site	Date	Collector	Other Data
5	Humphreys	10 mi SW Belzoni	26 Jun 1987	S. Testa III	
1	Issaquena	Valley Park	26 Jun 1987	S. Testa III	
1	Jackson	3 mi E Ocean Springs	22 May 1983	P.K. Lago	
	Jackson	Horn Island		(Richmond, 1962)	
11	Jackson	Ocean Springs	12-14 Aug 1977	S.E. Hurdle	
3	Jones	Lake Bogue Homa	11 Aug 1986	P.K. Lago	
1	Lafayette	Oxford	21 May 1979	P.K. Lago	
6	Lafayette	Oxford	7 Jun 1978	P.K. Lago	
2	Lafayette	Oxford	13 Jul 1978	D.F. Stanford	
1	Lafayette	6 mi ENE Oxford	15 Jul 1986	S. Testa III	
2	Lafayette	7 mi NW Oxford	18 Jul 1984	P.K. Lago	
1	Lafayette	T7S,R2W, Sec. 34	30 May 1978	P.K. Lago	
1	Lamar	4.5 mi N Baxterville, Half Moon Ck.	27 Jun 1986	P.K. Lago	
9	Lauderdale	3 mi S Arundel	11 Aug 1986	P.K. Lago	
20	Leflore	1.5 mi NW Itta Bena	26 Jun 1987	S. Testa III	
1	Lowndes	T17N, R16E, Sec. 34	1 Oct 1991	D.M. Pollock	bl.light
5	Madison	7.5 mi SE Canton	19 Jun 1987	S. Testa III	
1	Marion	Lake Columbia	27 Jun 1986	S. Testa III	
1	Marshall	Holly Springs	27 Jul 1977	S.E. Hurdle	
14	Marshall	Wall Doxey St. Pk.	30 Jul 1986	S. Testa III	
16	Oktibbeha	Adaton	3-5 Jun 1981	W.H. Cross	
2	Oktibbeha	Bethel Road	2 Jul 1981	S. Clemmer	
1	Oktibbeha	Starkville	14 Jul 1973	W.H. Cross	
1	Oktibbeha	6 mi SW Starkville	15 Jun 1984	R.L.& B. Brown	
1	Oktibbeha	6 mi SW Starkville	30 Jun 1984	R.L.&B. Brown	
1	Oktibbeha	T18N,R14E, Sec.23	16 Jul 1991	T.L. Schiefer	mv
2	Quitman	2 mi NE Marks	15 Jul 1978	D.F. Stanford	
44	Sharkey	2.5 mi E Anguilla	26 Jun 1987	S. Testa III	
1	Simpson	3.5 mi SSW Mendenhall	30 Aug 1985	B.P. Stark	
2	Stone	4 mi NW McHenry	25 May 1987	S. Testa III	
2	Stone	13 mi SE Wiggins	26 Jun 1986	S. Testa III	
1	Stone	Red Ck. X Hwy 15	9 May 1986	S. Testa III	
6	Stone	Red Ck. X Hwy 15	18 May 1987	P.K. Lago	
3	Stone	Univ. Miss. Forestlands	29 Jun 1986	P.K. Lago	
1	Tate	2 mi N Coldwater	5 Jun 1987	P.K. Lago	
1	Tishomingo	Tishomingo St. Pk.	17 Jun 1986	S. Testa III	
6	Tishomingo	Tishomingo St. Pk.	29-30 Jul 1977	S.E. Hurdle	
1	Union	2 mi NE Etta	12 May 1992	P.K. Lago	bl.light
1	Union	11 mi W New Albany	28 Jul 1986	P.K. Lago	
1	Webster	2 mi SE Cumberland T20N,R12E, Sec.17	12 Jun 1990	T.L. Schiefer	bl.light

Appendix 19. *Berosus infuscatus.*

No.	County	Site	Date	Collector	Other Data
1	Adams	14 mi E Sibley	25 Jun 1987	P.K. Lago	
1	Adams	14 mi E Sibley, Pipe Lake	18 May 1983	P.K. Lago	
1	Adams	Natchez	17 May 1983	A.E. Zuccaro Jr.	
4	Adams	Natchez St. Pk.	17 May 1983	P.K. Lago	
2	Adams	Natchez St. Pk.	23 Jun 1983	P.K. Lago	
2	Amite	3.5 ENE Liberty	25 Jun 1987	S. Testa III	
1	Amite	Mt. Nebo Lake	25 Jun 1987	S. Testa III	
38	Attala	10 mi SW Sallis	1 Jul 1986	S. Testa III	
15	Attala	8.5 SW mi Sallis	1 Jul 1986	P.K. Lago	
4	Bolivar	2 mi W Rosedale	11 Apr 1986	S. Testa III	
2	Bolivar	2 mi W Rosedale	19 Jun 1986	S. Testa III	
6	Bolivar	2 mi W Rosedale	20 Jun 1980	P.K. Lago	
2	Bolivar	2 mi W Rosedale	23 Aug 1980	P.K. Lago	
5	Bolivar	2 mi W Rosedale	7 Oct 1983	P.K. Lago	
1	Bolivar	2 mi W Rosedale	10 Oct 1980	P.K. Lago	
7	Bolivar	2 mi S Rosedale	19 Jun 1986	P.K. Lago	
89	Bolivar	Gr. River Rd. St. Pk.	19 Jun 1986	S. Testa III, P.K. Lago	
4	Calhoun	Calhoun City	11 Aug 1987	S. Testa III	
2	Calhoun	T11S,R2W, Sec. 30	12 Jul 1978	D. F. Stanford	
1	Calhoun	T11S,R3W, Sec. 25	12 Jul 1978	D.F. Stanford	
2	Carroll	Carrollton	12 Jul 1986	S. Testa III	
1	Choctaw	Ackerman	11 Aug 1987	S. Testa III	
1	Clay	T16S,R6E, Sec.20 SE, Black Belt Prairie	13 May 1991	D. Pollock	bl.light
116	De Soto	8 mi WSW Hernando	1 Aug 1987	S. Testa III	
2	De Soto	Southaven	5 Jun 1987	S. Testa III	
9	Forrest	2.5 mi NW Fruitland Park	21 May 1987	S. Testa III	
1	Forrest	6 mi WSW McLaurin	23 Jun 1986	S. Testa III	
1	George	12 mi SW Lucedale, Pascagoula W.M.A.	13 Apr 1992	P.K. Lago	
1	George	12 mi SW Lucedale	21 May 1983	P.K. Lago	
53	George	12 mi SW Lucedale Rines Lake	19 May 1987	S. Testa III, P.K. Lago	
1	George	3 mi SSW Benndale	24 May 1980	P.K. Lago	
1	George	7 mi SSE Lucedale	26 May 1987	P.K. Lago	
2	Greene	6 mi SE McLain	27 May 1987	S. Testa III	
34	Grenada	Grenada Lake Dam Area	14 Aug 1987	S. Testa III	
2	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	5-11 Jun 1991	T.L. Schiefer	mv & bl.light
2	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	17-23 Jul 1991	T.L. Schiefer	bl.light
24	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	27 Jul 1991	D. Pollock, S. Testa III	
5	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	28 Aug-3 Sep 1991	T.L.Schiefer sandbar	bl.light on
3	Grenada	T21N,R3E, Sec.7SW	18 Jun 1990	T.L. Schiefer	bl.light
1	Hancock	1 mi SSW Lakeshore	23 Jun 1987	P.K. Lago	bl.light
1	Hancock	1 mi SSW Lakeshore	12 Aug 1986	P.K. Lago	bl.light
1	Hancock	1.5 mi SW Lakeshore	12 Aug 1986	P.K. Lago	bl.light
2	Hancock	4 mi NW Kiln	26 May 1980	P.K. Lago	
17	Hancock	Point Clear Island	14 Feb 1987	P.K. Lago	artesian pond
9	Hancock	Point Clear Island	14 Feb 1987	P.K. Lago	brackish pond (3.5 0/00)
11	Hancock	Point Clear Island	14 Feb 1987	P.K. Lago	brackish pond (6 0/00)
6	Hancock	Point Clear Island	28 Feb 1987	P.K. Lago	artesian pond
56	Hancock	Point Clear Island	28 Feb 1987	P.K. Lago	brackish pond
17	Hancock	Point Clear Island	24 Apr 1987	P.K. Lago	artesian pond
1	Hancock	Point Clear Island	24 Apr 1987	P.K. Lago	brackish pond (3.5 0/00)
2	Hancock	Point Clear Island	24 Apr 1987	P.K. Lago	brackish pond (8 0/00)
24	Hancock	Point Clear Island	9 May 1986	P.K. Lago	bl.light
1	Hancock	Point Clear Island	15 Jun 1986	P.K. Lago	bl.light
15	Hancock	Point Clear Island	23 Jun 1987	P.K. Lago	brackish pond
16	Hancock	Point Clear Island	23 Jun 1987	P.K. Lago	bl.light
39	Hancock	Point Clear Island	24 Jun 1986	P.K. Lago	bl.light
1	Hancock	Stennis Space Center	25 Jun 1991	P.K. Lago	
1	Harrison	8 mi NE Saucier	11 Aug 1983	P.K. Lago	
2	Harrison	2 mi N Lyman	25 May 1980	P.K. Lago	
5	Harrison	3.5 mi NE Saucier	13-14 May 1984	P.K. Lago	
26	Harrison	5 mi E Saucier	25 May 1987	S. Testa III	
2	Harrison	Biloxi	20 May 1978	P.K. Lago	
1	Harrison	T5S,R12W, Sec.24	27 Feb 1988	S. Testa III	
3	Hinds	5 mi NW Clinton	19 May 1979	P.D. Hartfield	
2	Humphreys	10 mi SW Belzoni	26 Jun 1987	S. Testa III	
6	Issaquena	.7 mi S Valley Park	26 Jun 1987	S. Testa III	
1	Jackson	1 mi W Hwy 90 & 57, T7S,R8W, Sec.25	5 Mar 1991	D.M. Pollock	bl.light
32	Jackson	11 mi NW Van Cleave	25 May 1987	S. Testa III	
11	Jackson	3 mi E Ocean Springs	22 May 1983	P.K. Lago	
2	Jackson	4 mi SW Hurley	26 May 1987	S. Testa III	
	Jackson	Horn Island		(Richmond, 1962)	
1	Jackson	Ocean Springs	13 Aug 1977	S.E. Hurdle	
1	Jackson	Ocean Springs	13 May 1984	P.K. Lago	
1	Jackson	T5S,R7W, Sec. 18	19 May 1978	D.F. Stanford	
2	Jasper	4 mi S Heidelburg	14 Jun 1987	S. Testa III	
5	Jones	Sandersville	11 Aug 1986	P.K. Lago	
1	Kemper	3 mi N Scooba, T12N,R18E, Sec.19 SE	3 Oct 1991	T.L. Schiefer	bl.light
1	Lafayette	Abbeville	26 Nov 1977	M.Chapman	
54	Lafayette	4 mi W Abbeville	27 Jul 1986	S. Testa III	
39	Lafayette	4.5 mi SW Abbeville	27 Jul 1986	M.C. Beiser, S. Testa III	
1	Lafayette	Oxford	17 Mar 1982	P.K. Lago	
3	Lafayette	Oxford	18 Mar 1977	G. Sparks	
1	Lafayette	Oxford	30 Mar 1977	P.K. Lago	
1	Lafayette	Oxford	30 Mar 1981	P.K. Lago	
2	Lafayette	Oxford	3-7 Apr 1978	P.K. Lago	
4	Lafayette	Oxford	23 Apr 1980	P.K. Lago	
7	Lafayette	Oxford	4-7 May 1977	P.K. Lago	
1	Lafayette	Oxford	7 May 1979	P.K. Lago	
1	Lafayette	Oxford	10 May 1991	P.K. Lago	
1	Lafayette	Oxford	11 May 1980	P.K. Lago	
23	Lafayette	Oxford	16-23 May 1977	P.K. Lago	
1	Lafayette	Oxford	21 May 1979	P.K. Lago	
2	Lafayette	Oxford	26-28 May 1982	P.K. Lago	
8	Lafayette	Oxford	29-30 May 1977	P.K. Lago	
1	Lafayette	Oxford	4 Jun 1980	P.K. Lago	
2	Lafayette	Oxford	7 Jun 1982	P.K. Lago	
9	Lafayette	Oxford	7-12 Jun 1978	P.K. Lago	
10	Lafayette	Oxford	8-9 Jun 1978	P.K. Lago, D.F. Stanford	
1	Lafayette	Oxford	11 Jun 1992	M. S. Caterino	
6	Lafayette	Oxford	11-12 Jun 1978	P.K. Lago	
2	Lafayette	Oxford	14 Jun 1979	P.K. Lago	
68	Lafayette	Oxford	15 Jun 1986	S. Testa III	
3	Lafayette	Oxford	16 Jun 1978	D.F. Stanford	
1	Lafayette	Oxford	4 Jul 1988	S. Testa III	
12	Lafayette	Oxford	6-9 Jul 1978	P.K. Lago, G.W. Edwards	
1	Lafayette	Oxford	15 Jul 1986	S. Testa III	
1	Lafayette	Oxford	17 Jul 1984	P.K. Lago	
5	Lafayette	Oxford	25-30 Jul 1978	P.K. Lago	
1	Lafayette	Oxford	7 Sep 1986	S. Testa III	
2	Lafayette	Oxford	12 Oct 1979	W.C. Northern	
6	Lafayette	1.5 mi SE Oxford	19 Apr 1979	A. Johnson	
1	Lafayette	5 mi E Oxford	20 May 1977	D.F. Stanford	
1	Lafayette	5 mi E Oxford	6 Jul 1977	D.F. Stanford	
2	Lafayette	5 mi NW Oxford	31 May 1978	P.K. Lago	
42	Lafayette	5 mi NW Oxford	12 Jun 1984	D.F. Stanford	
2	Lafayette	5 mi SW Abbeville	27 Jul 1986	S. Testa III	
13	Lafayette	6 mi ENE Oxford	15 Jul 1986	S. Testa III	
3	Lafayette	7 mi NW Oxford	18 Jul 1993	P.K. Lago	
1	Lafayette	7 mi W Oxford	29 May 1982	P.K. Lago	
2	Lafayette	8 mi NE Oxford	17 Sep 1987	M. Purvis	
4	Lafayette	11 mi NW Oxford	25 Jul 1978	S.E. Hurdle	
1	Lafayette	11 mi NW Oxford	24 Oct 1985	S. Testa III	
1	Lafayette	T7S,R4W, Sec.24	24 Mar 1977	M.L. Baker	
1	Lafayette	T7S,R4W, Sec. 24	3 May 1979	M.O.Mann	
5	Lafayette	T7S,R4W, Sec.24	17 Jul 1978	D.F. Stanford	
2	Lafayette	T9S,R3W, Sec. 19	18 Jul 1978	D.F. Stanford	
1	Lafayette		20 Jun 1977	D. F. Stanford	
36	Lamar	3.5 mi NNE Baxterville	27 Jun 1986	S. Testa III	
12	Lamar	3.5 WNW Purvis	20 Jun 1987	P.K. Lago	
1	Lamar	5 mi N Baxterville	19 Apr 1979	P.K. Lago	
1	Lamar	5 mi N Baxterville	27 May 1980	P.K. Lago	
1	Lauderdale	3 mi S Arundel	11 Aug 1986	P.K. Lago	
18	Leflore	6 mi WSW Itta Bena	26 Jun 1987	S. Testa III	
10	Lowndes	2.5 mi W Columbus	11 Aug 1987	S. Testa III	
4	Lowndes	T17N,R16E, Sec.34	7 Jul 1991	D.M. Pollock	bl.light
8	Lowndes	T17N,R16E, Sec.34	1 Oct 1991	D.M. Pollock	bl.light
1	Madison	10 mi NE Canton	6 May 1980	P.K. Lago	
3	Madison	7.5 mi SE Canton	19 Jun 1987	S. Testa III	
1	Marion	Lake Columbia	27 Jun 1986	S. Testa III	
1	Marshall	Holly Springs	9 Jul 1977	S.E. Hurdle	
1	Marshall	Holly Springs	15 Jul 1977	S.E. Hurdle	
10	Marshall	T3S,R3W, Sec. 13	10 Jun 1977	S.E. Hurdle	
1	Marshall	Wall Doxey St. Pk.	15 Jun 1986	P.K. Lago	
1	Marshall	Wall Doxey St. Pk.	30 Jul 1986	S. Testa III	
1	Oktibbeha	T19N,R15E, Sec.16	7 Apr 1991	D.M. Pollock	bl.light
4	Oktibbeha	T19N,R15E, Sec.16	15 Jul 1991	D.M. Pollock	bl.light
1	Oktibbeha	T19N,R15E, Sec.16	5 Aug 1991	D.M. Pollock	
1	Oktibbeha	T19N,R15E, Sec.35	13 Jun 1990	D.M. Pollock	bl.light
1	Pearl River	4.5 mi SW Silver Run	12 May 1986	P.K. Lago	
15	Perry	13.5 mi S New Augusta	22 May 1987	P.K. Lago	
1	Perry	3 mi SW Beaumont	22 May 1987	P.K. Lago	
1	Pike	3 mi S Magnolia	10 Jun 1977	B.P. Stark	
2	Pontotoc	1 mi N Pontotoc	21 Jun 1977	R.B. Head	
15	Sharkey	2.5 mi E Anguilla	26 Jun 1987	S. Testa III	
2	Sharkey	Rolling Fork	26 Jun 1987	S. Testa III	
1	Simpson	3.5 mi SSW Mendenhall	30 Aug 1985	B.P. Stark	
10	Stone	13 mi SE Wiggins	8 May 1986	P.K. Lago	

No.	County	Site	Date	Collector	Other Data
4	Stone	13 mi SE Wiggins	20 May 1987	P.K. Lago	
2	Stone	13 mi SE Wiggins	26 Jun 1986	P.K. Lago	
7	Stone	4 mi NW McHenry	25 May 1987	S. Testa III	
4	Stone	Red Ck. X Hwy 15	9 May 1986	P.K. Lago, S. Testa III	
11	Stone	Red Ck. X Hwy 15	18 May 1987	P.K. Lago	
3	Stone	T4S,R1W, Sec. 6	18-20 May 1978	P.K. Lago	
4	Stone	T4S,R1W, Sec. 6	8 May 1978	P.K. Lago	
1	Stone	Univ. Miss. Forestlands	5 Apr 1979	P.K. Lago	
1	Stone	Univ. Miss. Forestlands	11 Apr 1992	P.K. Lago	
1	Stone	Univ. Miss. Forestlands	18 May 1976	P.K. Lago	
37	Stone	Univ. Miss. Forestlands	13-18 May 1986	S. Testa III, P.K. Lago	
1	Stone	Univ. Miss. Forestlands	24 May 1980	P.K. Lago	
1	Stone	Univ. Miss. Forestlands	11 Aug 1988	P.K. Lago	
4	Tallahatchie	8 mi ESE Charleston	14 Apr 1992	M. S. Caterino	
4	Tishomingo	5 mi E Tishomingo	9 Jun 1984	P.K. Lago	
2	Tishomingo	Tishomingo St. Pk.	1 May 1992	P.K. Lago	bl.light
2	Tishomingo	Tishomingo St. Pk.	17 Jun 1986	S. Testa III	
2	Tishomingo	Tishomingo St. Pk.	8 Jul 1988	S. Testa III	
1	Tishomingo	Tishomingo St. Pk.	22 Jul 1978	P.K. Lago	
1	Tunica	5 mi W Robinsonville	17 Apr 1978	D. F. Stanford	
2	Union	2 mi NE Etta	12 May 1992	P.K. Lago	bl.light
36	Union	10 mi W New Albany	18 Jul 1986	P.K. Lago	
34	Union	11 mi W New Albany	28 Jul 1986	P.K. Lago	
61	Union	12.5 mi W New Albany	28 Jul 1986	P.K. Lago	
6	Washington	Greenville	early Jul 1982	G. Snodgrass	bl.light
1	Washington	Leland	18 Oct 1985	C. T. Bryson	
3	Wayne	3.5 NW State Line	19 May 1983	P.K. Lago	
1	Wayne	State Line	20 May 1983	P.K. Lago	
1	Wilkinson	Buffalo Riv X Hwy 61	25 Jun 1982	P.K. Lago	
2	Yalobusha	5 m SW Coffeeville	17 Jul 1986	P.K. Lago	

Appendix 20. *Berosus ordinatus.*

4	Bolivar	2 mi W Rosedale	11 Apr 1986	P.K. Lago
4	Harrison	12.5 mi E Saucier	25 May 1987	S. Testa III
4	Jackson	11.mi NW Van Cleave	25 May 1987	S. Testa III
6	Lamar	3.5 mi WNW Purvis	25 Jun 1987	P.K. Lago

Appendix 21. *Berosus pantherinus.*

2	Adams	Natchez St. Pk.	23 Jun 1982	P.K. Lago	
1	Adams	Taylor	2 Apr 1973	J.A. Davis	
1	Alcorn	15.5 mi W Corinth	18 May 1992	P.K. Lago	bl.light
13	Bolivar	2 mi W Rosedale	23 Aug 1980	P.K. Lago	
1	Bolivar	Gr. River Rd. St. Pk.	19 Jun 1986	S. Testa III	
1	Calhoun	13 mi NE Bruce	6 Jun 1984	P.K. Lago	
2	Calhoun	4 mi SW Calhoun City	3 Jul 1987	S. Testa III	small stream
2	Choctaw	Ackerman	11 Aug 1987	S. Testa III	
7	Claiborne	1.5 mi SW Port Gibson	26 Jun 1987	S. Testa III	
3	De Soto	Southaven	7 Mar 1987	S. Testa III	
2	George	12 mi SW Lucedale	19 May 1987	P.K. Lago	
1	George	12 mi SW Lucedale Rines Lake	19 May 1987	S. Testa III	
1	George	12 mi SW Lucedale	21 May 1983	P.K. Lago	
14	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	10 May 1991	T.L. Schiefer	bl.light
6	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	21 May 1991	J.R. MacDonald, T.L. Schiefer	bl.light
1	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	29 May-4 Jun 1991	R.L. Brown	bl.light
4	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	5-11 Jun 1991	T.L. Schiefer	mv & bl.light
6	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	18 Jun 1990	T.L. Schiefer	bl.light
2	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	17-23 Jul 1991	T.L. Schiefer	bl.light
5	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	27 Jul 1991	S. Testa III	
5	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	7-13 Aug 1991	R.L. Brown, J.R. MacDonald	bl.light on sandbar
2	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	28 Aug-3 Sep 1991	T.L. Schiefer	bl.light
1	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	3 Oct 1991	T.L. Schiefer	bl.light
6	Holmes	Holmes Co. St. Pk.	1 Jul 1986	P.K. Lago	
3	Issaquena	2 mi SW Shipland	20 Jun 1992	P.K. Lago	
1	Issaquena	7 mi S Valley Park	26 Jun 1987	S. Testa III	
1	Lafayette	Abbeville	26 Feb 1977	M. Chapman	
2	Lafayette	1.5 mi NE Abbeville	2 Mar 1979	D. Massey	
1	Lafayette	4.5 mi SW Abbeville	27 Jul 1986	S. Testa III	
3	Lafayette	Oxford	8 Mar 1979	J.B. Stribling, D. Massey	
1	Lafayette	Oxford	17 Mar 1982	P.K. Lago	
1	Lafayette	Oxford	30 Mar 1977	P.K. Lago	
1	Lafayette	Oxford	30 Mar 1981	P.K. Lago	
4	Lafayette	Oxford	7 Apr 1977	J. Brady	
2	Lafayette	Oxford	7 Apr 1978	P.K. Lago	
1	Lafayette	Oxford	18 Apr 1978	P.K. Lago	
1	Lafayette	Oxford	7 May 1979	P.K. Lago	
8	Lafayette	Oxford	10 May 1991	P.K. Lago	
2	Lafayette	Oxford	12 May 1979	W.C. Northern	
1	Lafayette	Oxford	19 May 1982	P.K. Lago	
1	Lafayette	Oxford	21 May 1979	P.K. Lago	
1	Lafayette	Oxford	31 May 1977	P.K. Lago	
1	Lafayette	Oxford	6 Jun 1978	P.K. Lago	
1	Lafayette	Oxford	7 Jun 1982	P.K. Lago	
3	Lafayette	Oxford	8 Jun 1978	P.K. Lago	
6	Lafayette	Oxford	12-18 Jun 1978	P.K. Lago	
2	Lafayette	Oxford	25-27 Jun 1977	P.K. Lago	
1	Lafayette	Oxford	28 Jul 1979	P.K. Lago	
2	Lafayette	1 mi N Oxford	8 Aug 1977	S.E. Hurdle	
10	Lafayette	5 mi E Oxford	18-20 Jun 1977	D.F. Stanford	
6	Lafayette	5 mi E Oxford	27 Jul 1977	D.F. Stanford	
1	Lafayette	5 mi E Oxford	6 Aug 1977	D.F Stanford	
1	Lafayette	5 mi NW Oxford	31 May 1978	P.K. Lago	
1	Lafayette	8 mi NE Oxford	6 Sep 1991	M. S. Caterino	
6	Lafayette	11 mi NE Oxford	20 Apr 1979	R.W. Goodwin	
1	Lafayette	11 mi NE Oxford	17 Sep 1979	J.B. Stribling	
2	Lafayette	11 mi NW Oxford	25 Jul 1978	S.E. Hurdle	
1	Lafayette	11 mi NW Oxford	24 Oct 1985	S. Testa III	
2	Lafayette	11 mi NW Oxford	24 Oct 1978	R.W. Goodwin	
1	Lafayette	T7S,R2W, Sec. 25	27 Sep 1978	J. Stribling	
1	Lafayette	T7S,R4W, Sec.24	24 Mar 7(?)	M.L. Baker	
2	Lafayette	T8S,R4W, Sec. 5	11 Nov 1977	D.F. Stanford	
1	Lauderdale	1.5 mi SSE Collinsville	11 Aug 1986	P.K. Lago	
1	Lauderdale	3 mi S Arundel	11 Aug 1986	P.K. Lago	
2	Lowndes	Lake Lowndes St. Pk.	23-25 Jun 1981	P.K. Lago	
1	Lowndes	T17N,R16E, Sec.34	7 Jul 1991	D.M. Pollock	bl.light
3	Marshall	Holly Springs	27 Jul 1977	S.E. Hurdle	
2	Marshall	T3S,R3W, Sec. 13	10 Jun 1977	S.E. Hurdle	
3	Oktibbeha	Adaton	3-9 Jun 1981	W.H. Cross	
1	Oktibbeha	Starkville	19 May 1981	R.L. Brown	
3	Oktibbeha	Starkville	8 Aug 1981	R.L. Brown	
3	Oktibbeha	Ag. Coll. [MS St. Univ.]	Oct 1895	H.E. Weed	
1	Oktibbeha	Ag. Coll. [MS St. Univ.]		H.E. Weed	
1	Pontotoc	1 mi SE Ecru	24 Apr 1980	P.R. Miller	
1	Quitman	5 mi S Sledge	16 Mar 1977	S.E. Hurdle	
1	Simpson	4 mi SE Pinola	24 Jun 1982	B.P. Stark	
1	Tallahatchie	8 mi ESE Charleston	14 Apr 1992	M. S. Caterino	
2	Tallahatchie	3 mi S Charleston	7 Jun 1992	P.K. Lago	
15	Tate	2 mi N Coldwater	5 Jun 1987	P.K. Lago	
1	Tishomingo	Tishomingo St.Pk.	29 Jul 1977	S.E. Hurdle	
1	Tunica	2 mi N Robinsonville	15 Feb 1979	P.K. Lago	
3	Tunica	5.5 mi W Robinsonville	17 Jun 1978	P.K. Lago	
2	Yalobusha	5 mi SW Coffeeville	11 Jul 1986	P.K. Lago	

Appendix 22. *Berosus peregrinus.*

1	Adams	Homochitto Natl. Forest	19 Jun 1979	P.D. Hartfield	
3	Attala	10 mi SW Sallis	1 Jul 1986	S. Testa III	
1	Bolivar	2 mi W Rosedale	20 Jun 1980	P.K. Lago	
1	Choctaw	12.5 mi NNE Weir	11 Aug 1987	S. Testa III	
6	Claiborne	Sand Ck. @ waterfall	3 Jun 1986	B.P. Stark	
1	De Soto	Southaven	7 Mar 1987	S. Testa III	
3	George	12 mi SW Lucedale	19 May 1987	S. Testa III, P.K. Lago	
1	Grenada	T21N R2E, Sec.12,13N & R3E, Sec. 7S,18N	28 Aug-3 Sep 1991	T.L. Schiefer	bl.light
2	Grenada	T21N,R3E, Sec.7SW	18 Jun 1990	T.L. Schiefer	bl.light
1	Hancock	4 mi NW Kiln	26 May 1980	P.K. Lago	
1	Harrison	Saucier	27 Feb 1988	P.K. Lago	
3	Issaquena	Valley Park	26 Jun 1987	S. Testa III	
1	Jackson	T5S,R7W, Sec. 28	6 Apr 1979	A. Johnson	
1	Jones	Sandersville	11 Aug 1986	S. Testa III	
1	Kemper	Pawticfaw Ck. X Hwy 39	13 Jun 1987	C. Busack	
1	Lafayette	Oxford	7 Apr 1977	T.J. Brady	
2	Lafayette	Oxford	14 Jun 1982	P.K. Lago	
1	Lafayette	Oxford	28 Jul 1979	P.K. Lago	
1	Lafayette	Oxford	30 Jul 1978	P.K. Lago	
1	Lafayette	2 mi E Oxford	20 Jun 1977	D.F. Stanford	
1	Lafayette	6 mi ENE Oxford	15 Jul 1986	S. Testa III	
1	Lafayette	T7S,R2W, Sec.25	25 Jul 1978	P.K. Lago	
1	Lamar	5 mi N Boxterville	23 May 1980	P.K. Lago	
1	Marion	Lake Columbia	27 Jun 1986	S. Testa III	
1	Marshall	T3S,R3W, Sec. 13	10 Jun 1977	S.E. Hurdle	
2	Marshall	Wall Doxey St. Pk.	30 Jul 1986	S. Testa III	
1	Newton	6 mi SE Newton	10 May 1979	P.K. Lago	
1	Oktibbeha	6 mi SW Starkville	11 Jun 1984	R.L.& B. Brown	
1	Oktibbeha	Adaton	24 May 1982	W.H. Cross	
1	Oktibbeha	Adaton	3-4 Jun 1981	W.H. Cross	
1	Oktibbeha	Starkville	30 Sep 1980	P. Ramey	
3	Oktibbeha	T19N,R15E, Sec. 16	21 Apr 1987	T.L. Schiefer	
3	Pike	3 mi S Magnolia	10 Jun 1977	B.P. Stark	
2	Simpson	2 mi W Pinola	24 Jun 1982	B.P. Stark	
4	Stone	4 mi NW McHenry	25 May 1987	P.K. Lago	
3	Stone	Red Ck. X Hwy 15	9 May 1986	S. Testa III	
1	Stone	Red Ck. X Hwy 15	18 May 1987	P.K. Lago	
6	Stone	T3S,R10W, Sec. 24	26 Jun 1986	S. Testa III	
1	Stone	Univ. Miss. Forestlands	18 May 1987	P.K. Lago	
1	Union	12.5 mi W New Albany	28 Jul 1986	P.K. Lago	
10	Walthall	6 mi NE Tylertown	26 Apr 1987	S. Testa III	
1	Walthall	Tylertown	26 Apr 1981	P.K. Lago	
4	Webster	Walthall	11 Aug 1987	S. Testa III	
1	Wilkinson	Buffalo River X Hwy 61	24 Jun 1987	P.K. Lago	

Appendix 23. *Berosus pugnax.*

1	Alcorn	15.5 mi W Corinth	18 May 1992	P.K. Lago	bl.light
1	Attala	8.5 mi SW Sallis	1 Jul 1986	P.K. Lago	
2	Bolivar	Gr. River Rd. St. Pk.	19 Jun 1986	S. Testa III	
1	Choctaw	Ackerman	11 Aug 1987	S. Testa III	
6	Claiborne	1.5 mi SW Port Gibson	26 Jun 1987	S. Testa III	
42	De Soto	8 mi WSW Hernando	1 Aug 1987	S. Testa III	
6	George	12 mi SW Lucedale	19 May 1987	P.K. Lago	
39	George	12 mi SW Lucedale Rines Lake	19 May 1987	S. Testa III	
1	Greene	6 mi SE McLain	27 May 1987	S. Testa III	
3	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	21 May 1991	J.R. MacDonald, T.L. Schiefer	bl.light
2	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	27 Jul 1991	S. Testa III	
1	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	7-13 Aug 1991	R.L. Brown	bl.light on sandbar
1	Grenada	Grenada Lake Dam Area	14 Aug 1987	S. Testa III	
1	Hancock	Stennis Space Center	25 Jun 1991	P.K. Lago	
1	Hancock	2 mi N Waveland	23 May 1982	W.H. Cross	
1	Kemper	2 mi N Scooba, T12N,R18E, Sec.29,30	8 Aug 1991	T.L. Schiefer	bl.light
1	Lafayette	4.5 mi SW Abbeville	27 Jul 1986	S. Testa III	
1	Lafayette	Oxford	12 Jun 1978	P.K. Lago	
5	Lafayette	6 mi ENE Oxford	15 Jul 1986	S. Testa III	
1	Lafayette	11 mi NW Oxford	24 Oct 1978	R.W. Goodwin	
1	Lafayette	Puskus Lake	14 Sep 1987	H.E. Warren	
1	Madison	7.5 mi SE Canton	19 Jun 1987	S. Testa III	

No.	County	Site	Date	Collector	Other Data
1	Marshall	Holly Springs	23 Jul 1977	S.E. Hurdle	
3	Marshall	Wall Doxey St. Pk.	15 Jun 1986	P.K. Lago, M.C. Belser	
2	Marshall	Wall Doxey St. Pk.	30 Jul 1986	S. Testa III	
2	Oktibbeha	Adaton	3-4 Jun 1981	W.H. Cross	
2	Oktibbeha	Starkville	29-31 May 1975	W.H. Cross	
1	Panola	4 mi ENE Como	15 Jun 1979	W.P. Scott	
1	Sharkey	2.5 mi E. Anguilla	26 Jun 1987	S. Testa III	
1	Stone	4 mi NW McHenry	25 May 1987	S. Testa III	
1	Tishomingo	Tishomingo St. Pk.	29 Jul 1977	S.E. Hurdle	
17	Union	10 mi W New Albany	18 Jul 1986	P.K. Lago	
72	Union	12.5mi. W New Albany	28 Jul 1986	P.K. Lago	
1	Winston	Van Vleet	7 Sep 1980	P. Ramey	
2	Yalobusha	5 mi SW Coffeeville	17 Jul 1986	P.K. Lago	

Appendix 24. *Berosus striatus.*

1	Attala	8.5 mi SW Sallis	1 Jul 1986	P.K. Lago
1	Attala	10 mi SW Sallis 1 Jul 1986	1 Jul 1986	S. Testa III
1	Clarke	1.5 mi N Enterprise	11 Aug 1986	P.K. Lago
3	George	12 mi SW Lucedale	19 May 1987	S. Testa III, P.K. Lago
4	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec. 7S,18N	27 Jul 1991	S. Testa III
2	Harrison	8 mi NE Saucier	11 Aug 1988	P.K. Lago
9	Harrison	12.5 mi E Saucier	25 May 1987	P.K. Lago
1	Harrison	Saucier	27 Feb 1988	P.K. Lago
28	Jackson	11 mi NW Van Cleave	25 May 1987	S. Testa III
1	Jackson	4 mi SW Hurley	26 May 1987	S. Testa III
1	Lafayette	Oxford	31 May 1977	P.K. Lago
1	Lafayette	Oxford	4 Jul 1988	S. Testa III
3	Lafayette	Oxford	9 Jul 1979	G.W. Edwards
2	Lafayette	5 mi NW Oxford	12 Jun 1984	D.F. Stanford
6	Lafayette	6 mi ENE Oxford	15 Jul 1986	S. Testa III
1	Lafayette	T7S,R4W, Sec. 24	17 Jul 1978	D.F. Stanford
1	Lafayette	T9S,R3W, Sec.	18 Jul 1979	D.F. Stanford
1	Lamar	3.5 mi NNE Baxterville	27 Jun 1986	S. Testa III
12	Lamar	3.5 mi WNW Purvis	20-25 Jun 1987	P.K. Lago
1	Lamar	Lumberton	27 Jun 1986	P.K. Lago
1	Marshall	Holly Springs	11 Jun 1977	S.E. Hurdle
1	Marshall	T3S,R3W, Sec. 13	10 Jun 1977	S.E. Hurdle
1	Neshoba	4.5 mi NNW Philadelphia	11 Aug 1986	P.K. Lago
1	Perry	13.5 mi S New Augusta	22 May 1987	P.K. Lago
3	Stone	13 mi SE Wiggins	8 May 1986	P.K. Lago
6	Stone	4 mi NW McHenry	25 May 1987	S. Testa III
9	Stone	Red Ck. X Hwy 15	13 Aug 1986	P.K. Lago
1	Stone	T3S,R10W, Sec. 24	26 Jun 1986	S. Testa III
1	Stone	Univ. Miss. Forestlands	10 Apr 1981	J. Goddard
1	Stone	Univ. Miss. Forestlands	18 May 1987	P.K. Lago
7	Tippah	2.5 mi WSW Walnut	9 Mar 1993	P.K. Lago — woodland pond
1	Tishomingo	5 mi E Tishomingo	9 Jun 1984	P.K. Lago
1	Tishomingo	Tishomingo St. Pk.	1 May 1992	P.K. Lago — bl.light
2	Tishomingo	Tishomingo St. Pk.	17 Jun 1977	P.K. Lago
1	Tishomingo	Tishomingo St. Pk.	21 Jul 1978	S.E. Hurdle
8	Tishomingo	Tishomingo St. Pk.	8 Jul 1985	S. Testa III
1	Union	10 mi W New Albany	18 Jul 1986	P.K. Lago
3	Union	11 mi W New Albany	28 Jul 1986	P.K. Lago
2	Union	12.5 mi W New Albany	28 Jul 1986	P.K. Lago

Appendix 25. *Derallus altus.*

5	Choctaw	Choctaw Lake	11 Aug 1987	S. Testa III
2	Clarke	1.5 mi N Enterprise	11 Aug 1986	P.K. Lago
6	George	12 mi SW Lucedale	30 Jun 1986	P.K. Lago
1	Humphreys	10 mi SW Belzoni	26 Jun 1987	S. Testa III
1	Lafayette	Oxford	23 Apr 1980	P.K. Lago
1	Lafayette	Oxford	7 May 1979	P.K. Lago
12	Lafayette	Oxford	16 Jul 1979	P.K. Lago
18	Madison	7.5 mi SE Canton	19 Jun 1987	S. Testa III
1	Marion	Lake Columbia	27 Jun 1986	S. Testa III
1	Smith	Mize	28 Feb 1988	S. Testa III
1	Washington	Stoneville	12 Jul 1989	J. MacDonald — bl.light

Appendix 26. *Laccobius minutoides.*

3	Attala	Kosciusko	10 Aug 1988	P.K. Lago
13	Choctaw	12.5 mi NNE Weir	11 Aug 1987	S. Testa III
2	Union	12 mi SW New Albany	29 Jul 1988	S. Testa III

Appendix 27. *Laccobius teneralis.*

2	Attala	Kosciusko	10 Aug 1988	P.K. Lago
1	Lafayette	Oxford	14 Jun 1977	P.K. Lago
12	Pontotoc	2 mi W Ecru	29 Jul 1988	P.K. Lago
2	Tallahatchie	Charleston	16 Aug 1988	P.K. Lago
17	Union	12.5 mi SW New Albany	3 Sep 1988	S. Testa III
22	Union	7.5 mi S New Albany	29 Jul 1988	S. Testa III — sandy stream

Appendix 28. *Sperchopsis tessellatus.*

	George	Lucedale		(Spangler, 1961)
	Greene	Avera		(Spangler, 1961)
1	Harrison	W Ship Island	14 Mar 1992	T.L. Schiefer — on beach
1	Harrison	McHenry Branch, T4S, R11W, Sec. 29	4 Nov 1990	T.L. Schiefer — in leaf pack in stream
1	Lafayette	11 mi NE Oxford	10 Nov 1979	J.B. Stribling
1	Lafayette	T7S,R2W, Sec.25	8 Mar 1977	H.L. Schuster
	Lowndes	Columbus		(Spangler, 1961)
2	Pike	3 mi S Magnolia	20 Sep 1979	B.P. Stark
	Wayne	Clara		(Spangler, 1961)

No.	County	Site	Date	Collector	Other Data

Appendix 29. *Hydrobius tumidus.*

3	Amite	Mt. Nebo Lake	25 Jun 1987	S. Testa III	
1	Calhoun	4 mi SW Calhoun City	3 Jul 1988	S. Testa III	
1	Hancock	Point Clear Island	23 Jun 1987	S. Testa III	clinging to twig on beach nr. water
1	Hancock	Stennis Space Center	22 Mar 1991	P.K. Lago	
2	Hancock	Stennis Space Center	25 Jun 1991	P.K. Lago	
2	Madison		28 Mar 1986	F.N. Young	woods pond
1	Simpson	2 mi W Pinola	24 Jun 1993	B.P. Stark	

Appendix 30. *Crenitulus suturalis.*

2	Harrison	3.5 mi NE Saucier	14 May 1984	P.K. Lago	
32	Harrison	6 mi SSW Saucier	26 May 1988	S. Testa III	lake margin
1	Jackson	1.5 mi NW Van Cleave		S. Testa III	
23	Jackson	11 mi NW Van Cleave	26 May 1988	S. Testa III	Eleocharis in lily pond
1	Lamar	Lumberton	27 Jun 1986	P.K. Lago	
1	Newton	1 mi N Decatur	13 Aug 1988	P.K. Lago	
1	Stone	4 mi SW McHenry	25 May 1987	S. Testa III	
33	Stone	11.5 mi WSW Perkinston	28 May 1988	S. Testa III	
1	Stone	4.5 mi SW Perkinston	28 May 1987	P.K. Lago	
1	Tishomingo	Tishomingo St. Pk.	17 Jun 1986	S. Testa III	

Appendix 31. *Anacaena limbata.*

	Jackson	Horn Island	(Richmond, 1962)

Appendix 32. *Paracymus confusus.*

3	Adams	14 mi E Sibley, Pipe Lake	18 May 1983	P.K. Lago	
2	Adams	Natchez	17 May 1983	A. E. Zuccaro	
1	Calhoun	T11S,R3W, Sec. 25	12 Jul 1978		
1	Chickasaw	4 mi S Houston	3 Jul 1987	S. Testa III	
1	Clay	5 mi W West Point	6 Nov 1987	P.K. Lago	
1	Clay	5.5 mi S West Point	8 Mar 1993	P.K. Lago	pond in ditch
1	Copiah	4 mi NW Wesson	26 Apr 1987	S. Testa III	
1	Franklin	7 mi SW Meadville	15 Sep 1981	P.K. Lago	
1	Hancock	1 mi SSW Lakeshore	12 Aug 1986	P.K. Lago	
1	Harrison	3.5 mi NE Saucier	14 May 1984	P.K. Lago	
1	Harrison	5 mi NW De Lisle	26 Feb 1988	S. Testa III	
6	Humphreys	4 mi SW Belzoni	26 Jun 1987	S. Testa III	
1	Issaquena	.7 mi S Valley Park	26 Jun 1987	S. Testa III	
2	Jasper	6 mi NW Montrose	7 May 1980	P.K. Lago	
1	Jones	Sandersville	11 Aug 1986	S. Testa III	
1	Lafayette	Oxford	14 Jun 1979	P.K. Lago	
1	Lafayette	Oxford	17 Aug 1982	P.K. Lago	
1	Lafayette	8 mi NE Oxford	7 Sep 1987	S. Rosado	
1	Lafayette	9 mi NE Oxford	19 Feb 1992	M.S. Caterino	
1	Lamar	3.5 mi WNW Purvis	25 Jun 1987	P.K. Lago	
1	Lamar	Lumberton	27 Jun 1986	P.K. Lago	
2	Leflore	1.5 mi NW Itta Bena	26 Jun 1987	S. Testa III	
1	Quitman	2 mi NE Marks	15 Jul 1978	D. F. Stanford	
1	Quitman	2 mi S Sledge	25 Apr 1981	P.K. Lago	
1	Sharkey	Rolling Fork	26 Jun 1987	S. Testa III	
1	Simpson	4.5 mi NW Magee	1 Jul 1986	P.K. Lago	
1	Stone	T4S,R1W, Sec. 6	20 May 1978	P.K. Lago	
1	Stone	Univ. Miss. Forestlands	6 Apr 1979	P.K. Lago	
2	Tippah	2.5 mi WSW Walnut	9 Mar 1993	P.K. Lago	woodland pond
1	Tishomingo	5 mi E Tishmingo	9 Jun 1984	P.K. Lago	
1	Union	11 mi W New Albany	28 Jul 1986	P.K. Lago	
1	Warren	8 mi NE Bovina	24 Jun 1981	P.K. Lago	
1	Washington	Stoneville	12 Jul 1989	J. MacDonald	bl.light

Appendix 33. *Paracymus lodingi.*

32	Hancock	1 mi SSW Lakeshore	12 Aug 1986	S. Testa III	bl.light
1	Hancock	2 mi N Waveland	23 May 1982	W.H. Cross	
2	Hancock	Point Clear Island	28 Feb 1987	S. Testa III	brackish pond
2	Hancock	Point Clear Island	10 May 1986	S. Testa III	bl.light
2	Hancock	Point Clear Island	23 Jun 1987	S. Testa III	bl.light
76	Hancock	Point Clear Island	12-15 Aug 1986	S. Testa III	bl.light
6	Harrison	West Ship Island	14 Mar 1992	T.L. Schiefer	on beach
4	Jackson	Ocean Springs	23 May 1983	P.K. Lago	
1	Jackson	Ocean Springs	12 Aug 1977	S.E. Hurdle	
1	Jackson	Ocean Springs	3 Sep 1982	P.K. Lago	

Appendix 34. *Paracymus nanus.*

5	Adams	14 mi E Sibley, Pipe Lake	18 May 1983	P.K. Lago
3	Adams	14 mi E Sibley, Pipe Lake	29 May 1988	P.K. Lago
1	Bolivar	2 mi W Rosedale	20 Jun 1980	P.K. Lago
1	Clarke	1.5 mi N Enterprise	11 Aug 1986	P.K. Lago
1	Copiah	Lake Copiah	30 May 1988	P.K. Lago
1	Greene	10 mi N Leaksville	27 May 1988	P.K. Lago
1	Holmes	Holmes Co. St. Pk.	1 Jul 1986	P.K. Lago
1	Humphreys	4 mi SW Belzoni	26 Jun 1987	S. Testa III
1	Issaquena	Valley Park	26 Jun 1987	S. Testa III
2	Marion	Lake Bill Waller	25 May 1988	S. Testa III
2	Newton	1 mi N Decatur	13 Aug 1988	P.K. Lago
2	Oktibbeha	Dorman Lake	10 Apr 1981	W.H. Cross
1	Simpson	4.5 mi NW Magee	1 Jul 1986	P.K. Lago
10	Simpson	Simpson Legion Lake	23 May 1988	P.K. Lago
1	Stone	11 mi WSW Perkinston	28 May 1988	S. Testa III
1	Tishomingo	Tishomingo St. Pk.	8 Jul 1988	S. Testa III
1	Yazoo	1 mi W Bentonia	19 Jun 1987	S. Testa III

Appendix 35. *Paracymus reductus.*

No.	County	Site	Date	Collector	Other Data
1	Hancock	1.5 mi SW Lakeshore	12 Aug 1986	S. Testa III	bl.light

Appendix 36. *Paracymus seclusus.*

No.	County	Site	Date	Collector	Other Data
3	Harrison		4 Oct 1968	(Wooldridge, 1978)	

Appendix 37. *Paracymus subcupreus.*

No.	County	Site	Date	Collector	Other Data
4	Adams	14 mi E Sibley, Pipe Lake	18 May 1983	P.K. Lago	
1	Calhoun	Calhoun City	11 Aug 1987	S. Testa III	
3	Chickasaw	4 mi S Houston	3 Jul 1987	S. Testa III	
1	Clarke	Clarkco St. Pk.	26 Jun 1984	P.K. Lago	
1	Copiah	4 mi NW Wesson	26 Apr 1987	S. Testa III	
2	De Soto	8 mi WSW Hernando	1 Aug 1987	S. Testa III	
2	Grenada	T21N,R2E,sec.12,13N & R3E,sec.7S,18N	5 Jun 1991	M.W. MacGown, T.L. Schiefer	bl.light
1	Hancock	Point Clear Island	12 Aug 1986	S. Testa III	
1	Harrison	Lyman	26 Feb 1988	P.K. Lago	
1	Humphreys	10 mi SW Belzoni	26 Jun 1987	S. Testa III	
1	Humphreys	4 mi SW Belzoni	26 Jun 1987	S. Testa III	
3	Issaquena	0.7 mi S Valley Park	26 Jun 1987	S. Testa III	
1	Jackson	Ocean Springs	23 May 1983	P.K. Lago	
2	Jasper	6 mi NW Montrose	7 May 1980	P.K. Lago	
1	Lafayette	1 mi N Oxford	6 Mar 1977	M. L. Baker	
4	Lafayette	T7S,R2W, Sec. 34	23 Jun 1977	D Stanford & S.E. Hurdle	
4	Leflore	1.5 mi NW Itta Bena	26 Jun 1987	S. Testa III	
1	Lowndes	T17N,R16E,sec.5	11 May 1991	D.M. Pollock	bl.light
1	Oktibbeha	6 mi SW Starkville	15 Jun 1984	R.L. & B. Brown	
1	Oktibbeha	T19N,R15E,sec.35	13 Jun 1990	D.M. Pollock	bl.light
1	Pike	McComb	26 Apr 1987	S. Testa III	
1	Sharkey	2.5 mi E Anguilla	26 Jun 1987	S. Testa III	
11	Sharkey	Rolling Fork	26 Jun 1987	S. Testa III	
1	Simpson	2 mi W Pinola	24 Jun 1982	B. P. Stark	
2	Simpson	4.5 mi NW Magee	1 Jul 1986	P.K. Lago	
1	Tishomingo	5 mi E Tishomingo	9 Jun 1984	P.K. Lago	
1	Union	11 mi W New Albany	28 Jul 1986	P.K. Lago	
2	Wayne	Waynesboro	19 May 1983	P.K. Lago	

Appendix 38. *Enochrus blatchleyi.*

No.	County	Site	Date	Collector	Other Data
1	Amite	7 mi ENE Liberty	25 Jun 1987	S. Testa III	
1	De Soto	8 mi WSW Hernando	1 Aug 1987	S. Testa III	
4	Harrison	12.5 mi E Saucier	25 May 1987	S. Testa III	
1	Harrison	4.5 mi NNW Lyman	27 Feb 1988	S. Testa III	
1	Harrison	5 mi NW De Lisle	26 Feb 1988	S. Testa III	
20	Humphreys	4 mi SW Belzoni	26 Jun 1987	S. Testa III	
1	Lafayette	Oxford	14 Jun 1979	P.K. Lago	
1	Lafayette	7 mi W Oxford	29 May 1982	P.K. Lago	
1	Lafayette	8 mi NE Oxford	17 Sep 1987	S. Rosado	
1	Lamar	5 mi n Baxterville	23 May 1980	P.K. Lago	
2	Lamar	5 mi n Baxterville	27 Jun 1986	P.K. Lago	
1	Lamar	Lumberton	27 Feb 1986	P.K. Lago	
1	Leflore	6 mi WSW Itta Bena	26 Jun 1987	S. Testa III	
1	Lowndes	T17N, R16E, Sec. 34	3 Jun 1991	D.M. Pollock	bl.light
1	Lowndes	T17N, R16E, Sec. 34	19 Jun 1991	D.M. Pollock	bl.light
1	Marshall	Wall Doxey St. Pk.	30 Jul 1986	S. Testa III	
1	Pike	5.5 mi WSW McComb	25 Jun 1987	P.K. Lago	
2	Sharkey	2.5 mi E Anguila	26 Jun 1987	S. Testa III	
1	Washington	Stoneville	12 Jul 1989	J. MacDonald	bl.light

Appendix 39. *Enochrus cinctus.*

No.	County	Site	Date	Collector	Other Data
8	Amite	Mt. Nebo Lake	25 Jun 1987	S. Testa III	
2	Clarke	Clarkco St. Pk.	22 May 1985	P.K. Lago	
3	George	12 mi SW Lucedale	19 May 1987	P.K. Lago	
1	George	3 mi SSW Benndale	24 May 1980	P.K. Lago	
2	Greene	6 mi SE McLain	24 May 1987	S. Testa III	
6	Hancock	Stennis Space Center	25 Jun 1991	P.K. Lago	
1	Harrison	3.5 mi NE Saucier	13 May 1984	P.K. Lago	
1	Jackson	6 mi SSE Ocean Springs	9 May 1986	P.K. Lago	
1	Lafayette	Oxford	14 Mar 1977	R.L. Nolan	
4	Lafayette	Oxford	16 May 1978	P.K. Lago, D.F. Stanford	
1	Lafayette	Oxford	30 May 1977	P.K. Lago	
2	Lafayette	Oxford	12 Jun 1978	P.K. Lago, D.F. Stanford	
1	Lafayette	Oxford	5 Jul 1990	P.K. Lago	
1	Lafayette	5 mi NW Oxford	12 Jun 1984	D.F. Stanford	
1	Lafayette	6 mi ENE Oxford	15 Jul 1986	S. Testa III	
1	Lafayette	T7S,R4W, Sec. 24	24 Nov 1977	R.L. Nolan	
1	Neshoba	1.5 mi N Dixon	9 May 1979	P.K. Lago	
2	Simpson	Tanyard Ck. X Hwy 24	1 May 1980	B.P. Stark	
2	Stone	13 mi SE Wiggins	8 May 1986	P.K. Lago	
5	Stone	2 mi n Perkinston	25 May 1987	S. Testa III	
1	Tishomingo	Tishomingo St. Pk.	17 Jun 1986	S. Testa III	

Appendix 40. *Enochrus consors.*

No.	County	Site	Date	Collector	Other Data
7	Adams	14 mi E Sibley, Pipe Lake	25 Jun 1987	P.K. Lago	
4	Adams	14 mi E Sibley, Pipe Lake	18 May 1983	P.K. Lago	
5	Amite	Mt. Nebo Lake	25 Jun 1987	S. Testa III	
1	Forrest	2.5 mi NW Fruitland Pk.	21 May 1987	S. Testa III	
1	George	3 mi SSW Benndale	24 May 1980	P.K. Lago	
1	George	12 mi SW Lucedale Rines Lake	19 May 1987	S. Testa III	
1	Hancock	Point Clear Island	23 Jun 1987	bl.light	
1	Harrison	5 mi E Saucier	25 May 1987	S. Testa III	
5	Jackson	11 mi NW Van Cleave	25 May 1987	S. Testa III	
1	Jackson	6 mi SSE Ocean Springs	9 May 1986	P.K. Lago	
1	Jackson	1 mi W Hwy 90 & 57, T7S, R8W, Sec. 25	5 Mar 1991	D.M. Pollock	bl.light
	Jackson	Horn Island		(Richmond, 1968)	
6	Jefferson	4.5 mi S Fayette	25 Jun 1987	S. Testa III	
1	Lafayette	8 mi NE Oxford	17 Sep 1987	P. Pryor	
1	Lamar	3.5 mi N Baxterville	23 May 1979	P.K. Lago	
1	Lamar	3.5 mi NNE Baxterville	27 Jun 1986	S. Testa III	
25	Lamar	3.5 mi WNW Purvis	20-25 Jun 1987	P.K. Lago	
1	Leake	Carthage	8 May 1979	P.K. Lago	
1	Madison	R. Barnett Res. NE Jackson	15 Mar 1985	F.N. Young	
2	Marshall	Wall Doxey St. Pk.	15 Jul 1986	M.C. Beiser	
1	Simpson	3 mi WNW D'Lo	13 Feb 1986	P.K. Lago	
2	Stone	11 mi ESE Perkinston	24 May 1987	P.K. Lago	
3	Stone	Univ. Miss. Forestlands	18-21 May 1978	P.K. Lago	
1	Wayne	State Line	20 May 1983	P.K. Lago	

Appendix 41. *Enochrus consortus.*

No.	County	Site	Date	Collector	Other Data
1	Adams	Natchez	21 May 1977	A.E. Zuccaro Jr.	
21	Amite	Mt. Nebo Lake	25 Jun 1987	S. Testa III	
1	Calhoun	T1S,R3W, Sec. 25	12 Jul 1978	D.F. Stanford	
1	De Soto	8 mi WSW Hernando	1 Aug 1987	S. Testa III	
24	George	12 mi SW Lucedale	19 May 1987	P.K. Lago	
12	George	12 mi SW Lucedale Rines Lake	19 May 1987	S. Testa III	
1	Greene	6 mi SE McLain	27 May 1987	S. Testa III	
2	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec.7S,18N	10 May 1991	T.L. Schiefer	bl.light
2	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec.7S,18N	29 May-4 Jun 1991	R.L. Brown	bl.light
4	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec.7S,18N	5 Jun 1991	J.R. MacDonald, T.L. Schiefer	mv & bl.light
1	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec.7S,18N	27 Jul 1991	S. Testa III	
2	Hancock	1 mi SSW Lakeshore	23 Jun 1987	S. Testa III	bl.light
10	Hancock	1 mi SSW Lakeshore	12 Aug 1986	S. Testa III	
1	Hancock	1.5 mi SW Lakeshore	12 Aug 1986	S. Testa III	bl.light
1	Hancock	Point Clear Island	9 May 1986	S. Testa III	bl.light
3	Hancock	Point Clear Island	9 May 1986	S. Testa III	artesian pond
1	Hancock	Point Clear Island	10 May 1986	P.K. Lago	
5	Hancock	Point Clear Island	23 Jun 1987	S. Testa III	bl.light
1	Hancock	Point Clear Island	15 Aug 1986	S. Testa III	
1	Hancock	Point Clear Island	15 Aug 1986	S. Testa III	bl.light
10	Jackson	11 mi NW Van Cleave	25 May 1987	S. Testa III	
	Jackson	Horn Island		(Richmond, 1968)	
1	Jackson	Ocean Springs	22 May 1983	P.K. Lago	
3	Jefferson	4.5 mi S Fayette	25 Jun 1987	S. Testa III	
2	Lafayette	4 mi W. Abbeville	27 Jul 1986	S. Testa III	
1	Lafayette	Oxford	13 Apr 1977	S.E. Hurdle	
1	Lafayette	Oxford	23 Apr 1980	P.K. Lago	
1	Lafayette	Oxford	7 May 1978	P.K. Lago	
1	Lafayette	Oxford	19 May 1977	P.K. Lago	
1	Lafayette	Oxford	19 May 1982	P.K. Lago	
2	Lafayette	Oxford	21-27 May 1989	P.K. Lago	
1	Lafayette	Oxford	28 May 1982	P.K. Lago	
4	Lafayette	Oxford	30-31 May 1977	P.K. Lago	
1	Lafayette	Oxford	14 Jun 1982	P.K. Lago	
1	Lafayette	Oxford	16 Jun 1978	D.F. Stanford	
8	Lafayette	Oxford	18-20 Jun 1977	D.F. Stanford	
1	Lafayette	Oxford	28 Jun 1978	D.F. Stanford	
1	Lafayette	Oxford	30 Jun 1988	E.B. Lago	
2	Lafayette	Oxford	5 Jul 1978	D.F. Stanford	
1	Lafayette	Oxford	1 Aug 1978	P.K. Lago	
2	Lafayette	6 mi ENE Oxford	15 Jul 1986	S. Testa III	
11	Lamar	3.5 mi NNE Baxterville	27 Jun 1986	S. Testa III	
3	Lamar	3.5 mi WNW Purvis	20 Jun 1987	P.K. Lago	
1	Lowndes	Lake Lowndes St. Pk.	23 Jun 1981	P.K. Lago	
1	Lowndes	T17N, R16E, Sec. 34	19 Jun 1991	D.M. Pollock	bl.light
1	Lowndes	T17N, R16E, Sec. 5	11 May 1991	D.M. Pollock	bl.light
1	Lowndes	2.5 mi W Columbus	11 Aug 1987	S. Testa III	
1	Marion	Lake Columbia	26 Jun 1986	P.K. Lago	
1	Marshall	Holly Springs	11 Jun 1977	S.E. Hurdle	
2	Marshall	T3S,R3W, Sec. 13	10 Jun 1977	S.E. Hurdle	
1	Marshall	Wall Doxey St. Pk.	30 Jul 1986	P.K. Lago	
1	Neshoba	1.5 mi N Dixon	9 May 1979	P.K. Lago	
3	Newton	1 mi N Decatur	13 Aug 1968	P.K. Lago	
1	Newton	4 mi E Newton	10 May 1979	P.K. Lago	
1	Oktibbeha	T19N, R15E, Sec. 16	18 Sep 1990	D.M. Pollock	bl.light
1	Perry	Beaumont	28 Jun 1986	P.K. Lago	
1	Pike	3 mi S Magnolia	10 Jun 1977	S. Testa III	
2	Stone	11 mi ESE Perkinston	8 May 1986	P.K. Lago	
1	Stone	13 mi SE Wiggins	30 Apr 1981	P.K. Lago	
2	Stone	Univ. Miss. Forestlands	11 Apr 1992	P.K. Lago	
1	Stone	Univ. Miss. Forestlands	10 Jun 1977	P.K. Lago	
1	Sunflower	5 mi SE Indianola	24 May 1987	S. Testa III	
1	Tallahatchie	3.5 mi S Charleston	7 Jun 1992	P.K. Lago	
1	Tippah	4 mi N Ripley	18 May 1992	P.K. Lago	bl.light
3	Tishomingo	Tishomingo St. Pk.	26 Jun 1987	S.E. Hurdle	
1	Union	12.5 mi W New Albany	22 Jul 1978	P.K. Lago	
1	Walthall	4 mi W Tylertown	28 Jul 1986	M.K. McEwen	
1	Washington	Greenville	early Jul 1982	G. Snodgrass	bl.light
12	Yalobusha	5 mi SW Coffeeville	15 Mar 1977	P.K. Lago	

Appendix 42. *Enochrus hamiltoni.*

No.	County	Site	Date	Collector	Other Data
1	George	12 mi SW Lucedale	17 Jul 1986	P.K. Lago	
3	Hancock	1 mi SSW Lakeshore	15 Aug 1986	P.K. Lago	bl.light
2	Hancock	1 mi SSW Lakeshore	23 Jun 1987	P.K. Lago	bl.light
6	Hancock	1.5 mi SW Lakeshore	12 Aug 1986	P.K. Lago	bl.light
1	Hancock	Buccaneer St. Pk.	19 May 1987	P.K. Lago	
1	Hancock	Point Clear Island	14 Feb 1987	P.K. Lago	brackish pond
2	Hancock	Point Clear Island	28 Feb 1987	P.K. Lago	artesian pond
284	Hancock	Point Clear Island	24 Apr 1987	P.K. Lago	bl.light
15	Hancock	Point Clear Island	9 May 1986	P.K. Lago	bl.light
14	Hancock	Point Clear Island	10-12 May 1986	S. Testa III, P.K. Lago	
15	Hancock	Point Clear Island	23 Jun 1987	P.K. Lago	artesian pond

No.	County	Site	Date	Collector	Other Data
8	Hancock	Point Clear Island	23 Jun 1987	P.K. Lago	bl.light
82	Hancock	Point Clear Island	24 Jun 1986	P.K. Lago	
1	Hancock	Point Clear Island	24 Jun 1986	P.K. Lago	bl.light
8	Hancock	Point Clear Island	29 Jun 1984	P.K. Lago	
32	Hancock	Point Clear Island	12 Aug 1986	P.K. Lago	bl.light
2	Hancock	Point Clear Island	15 Aug 1986	S. Testa III	
1	Jackson	6 mi SSW Ocean Springs	9 May 1988	P.K. Lago	
	Jackson	Horn Island		(Richmond, 1962)	
1	Jackson	Ocean Springs	12 Aug 1977	S.E. Hurdle	
1	Lafayette	Oxford	16 Jun 1978	P.K. Lago	
7	Lamar	3.5 mi NNE Baxterville	27 Jun 1986	S. Testa III	
1	Stone	13 mi SE Wiggins	8 May 1986	P.K. Lago	
1	Stone	13 mi SE Wiggins	20 May 1987	P.K. Lago	
1	Stone	Univ. Miss. Forestlands	20 May 1978	P.K. Lago	
1	Tippah	4 mi N Ripley	18 May 1992	P.K. Lago	bl.light
2	Tishomingo	5 mi E Tishomingo	9 Jun 1984	P.K. Lago	

Appendix 43. *Enochrus interruptus.*

16	Amite	Mt. Nebo Lake	25 Jun 1987	S. Testa III
8	George	12 mi SW Lucedale	19 May 1987	P.K. Lago
1	George	12 mi SW Lucedale	21 May 1983	P.K. Lago
1	George	3 mi SSW Benndale	24 May 1980	P.K. Lago
2	George	12 mi SW Lucedale	19 May 1987	S. Testa III
		Rines Lake		
1	Hancock	Stennis Space Center	25 Jun 1991	P.K. Lago
	Jackson	Horn Island		(Richmond, 1962)
5	Lamar	3.5 mi NNE Baxterville	27 Jun 1986	S. Testa III
2	Stone	13 mi SE Wiggins	8 May 1986	P.K. Lago

Appendix 44. *Enochrus ochraceus.*

9	Adams	14 mi E Sibley, Pipe Lake	18 May 1983	P.K. Lago	
1	Adams	5 mi N Natchez	22 May 1978	P.K. Lago	
3	Adams	Natchez	17 May 1983	A.E. Zuccaro Jr.	
2	Adams	Natchez	21 May 1978	A.E. Zuccaro Jr.	
1	Adams	Natchez	25 May 1977	A.E. Zuccaro Jr.	
1	Adams	Natchez St. Pk.	17 May 1983	P.K. Lago	
2	Adams	Natchez St. Pk.	23 Jun 1982	P.K. Lago	
15	Amite	7 mi ENE Liberty	25 Jun 1987	S. Testa III	
42	Amite	Mt. Nebo Lake	25 Jun 1987	S. Testa III	
2	Attala	8.5 mi SW Salis	1 Jul 1986	P.K. Lago	
1	Bolivar	2 mi W Rosedale	11 Apr 1986	S. Testa III	
2	Calhoun	Calhoun City	11 Aug 1987	S. Testa III	
1	Calhoun	T11S,R3W, Sec. 25	12 Jul 1978	D.F. Stanford	
1	Chickasaw	4 mi S Houston	3 Jul 1987	S. Testa III	
1	Choctaw	Choctaw Lake	11 Aug 1987	S. Testa III	
2	Claiborne	1.5 mi SW Port Gibson	26 Jun 1987	S. Testa III	
2	Clarke	1.5 mi N Enterprise	11 Aug 1986	P.K. Lago	
1	Clay	5 mi W West Point	6 Nov 1987	P.K. Lago	
4	Clay	3.5 mi S West Point	8 Mar 1993	P.K. Lago	pond in ditch
1	Clay	Montpelier	6 Nov 1987	S. Testa III	
2	Coahoma	2 mi SE Jonestown	15 Jul 1978	D.F. Stanford	
3	Copiah	3 mi W Wesson	26 Apr 1987	S. Testa III	
1	Covington	Lake Mike Conner	29 May 1987	P.K. Lago	
1	De Soto	8 mi WSW Hernando	1 Aug 1987	S. Testa III	
9	Forrest	2.5 NW Fruitland Pk.	21 May 1987	S. Testa III	
2	Forrest	P. B. Johnson St. Pk.	30 Apr 1981	P.K. Lago	
1	George	12 mi SW Lucedale,	13 Apr 1982	P.K. Lago	
		Pascagoula W.M.A.			
1	George	12 mi SW Lucedale	21 May 1987	P.K. Lago	
3	George	12 mi SW Lucedale	30 Jun 1986	P.K. Lago	
2	George	3 mi SSW Benndale	24 May 1980	P.K. Lago	
1	George	7 mi S Benndale	11 Apr 1981	P.K. Lago	
5	George	7 miSSE Lucedale	26 May 1987	P.K. Lago	
1	Greene	4 mi W State Line	20 May 1983	P.K. Lago	
1	Greene	6 mi SE McLain	27 May 1987	S. Testa III	
2	Grenada	T21N, R3E, Sec. 7 SW	18 Jun 1990	T.L. Schiefer	bl.light
2	Grenada	T21N,R2E, Sec. 12,13N	21-28 May 1991	T.L. Schiefer	bl.light on
		& R3E, Sec. 7S,18N			sandbar
20	Grenada	T21N,R2E, Sec. 12,13N	5-11 Jun 1991	T.L. Schiefer	mv & bl.light
		& R3E, Sec. 7S,18N			
2	Grenada	T22N, R3E, Sec. 31 NW	18 Jun 1990	T.L. Schiefer	bl.light
22	Hancock	1 mi SSW Lakeshore	23 Jun 1987	S. Testa III	bl.light
2	Hancock	1 mi SSW Lakeshore	12 Aug 1986	S. Testa III	bl.light
2	Hancock	4 mi NW Kiln	26 May 1980	P.K. Lago	-
4	Hancock	Point Clear Island	14 Feb 1987	S. Testa III	artesian pond
1	Hancock	Point Clear Island	28 Feb 1987	S. Testa III	artesian pond
9	Hancock	Point Clear Island	28 Feb 1987	S. Testa III	brackish pond
3	Hancock	Point Clear Island	24 Apr 1987	S. Testa III	
5	Hancock	Point Clear Island	24 Apr 1987	S. Testa III	artesian pond
11	Hancock	Point Clear Island	24 Apr 1987	S. Testa III	bl.light
80	Hancock	Point Clear Island	10 May 1986	S. Testa III	bl.light
1	Hancock	Point Clear Island	20 May 1987	S. Testa III	artesian pond
4	Hancock	Point Clear Island	23 Jun 1987	S. Testa III	bl.light on
					beach
4	Hancock	Point Clear Island	23 Jun 1987	S. Testa III	in brackish
					pond
5	Hancock	Point Clear Island	12 Aug 1986	S. Testa III	bl.light
9	Hancock	Point Clear Island	12-15 Aug 1986	S. Testa III	
11	Hancock	Point Clear Island	15 Aug 1986	S. Testa III	bl.light
3	Hancock	Point Clear Island	27 Sep 1985	S. Testa III,	
				P.K. Lago	
3	Hancock	Point Clear Island	23 Oct 1986	S. Testa III	
2	Hancock	Stennis Space Center	25 Jun 1991	P.K. Lago	
8	Harrison	W Ship Island	14 Mar 1992	T.L. Schiefer	on beach
2	Harrison	13 mi E Saucier	27 Feb 1988	P.K. Lago	
1	Harrison	2 mi N Lyman	10 Apr 1981	P.K. Lago	
1	Harrison	2 mi N Lyman	25 May 1980	P.K. Lago	
3	Harrison	3.5 mi NE Saucier	14 May 1984	P.K. Lago	
1	Harrison	3.5 mi NE Saucier	18 Oct 1987	P.K. Lago	
28	Harrison	4.5 mi NW Lyman	27 Feb 1988	S. Testa III	
46	Harrison	5 mi NW De Lisle	26 Feb 1988	S. Testa III	
1	Harrison	8 mi NE Saucier	11 Aug 1988	P.K. Lago	
4	Harrison	8 mi E Saucier	27 Feb 1988	P.K. Lago	
5	Harrison	Biloxi	20 May 1978	P.K. Lago	
36	Harrison	Lyman	26 Feb 1988	P.K. Lago	
6	Harrison	Saucier	27 Feb 1988	P.K. Lago	
2	Harrison	T5S,R12W, Sec. 24	27 Feb 1988	S. Testa III	
1	Hinds	4 mi N Clinton	21 May 1977	B.P. Stark	
1	Holmes	Holmes Co. St. Pk.	1 Jul 1986	P.K. Lago	
7	Humphreys	10 mi SW Belzoni	26 Jun 1987	S. Testa III	
12	Humphreys	4 mi SW Belzoni	26 Jun 1987	S. Testa III	
1	Issaquena	Valley Park	26 Jun 1987	S. Testa III	
1	Jackson	1 mi W Hwy 90 & 57,	5 Apr 1991	D.M. Pollock	bl.light
		T7S, R8W, Sec. 25			
5	Jackson	1 mi W Hwy 90 & 57,	20 Apr 1990	R.L. Brown	bl.light
		T7S, R8W, Sec. 25			
4	Jackson	11 mi NW of Van Cleave	25 May 1987	S. Testa III	
1	Jackson	I-10 at Escatawpa River,	21 Apr 1990	R.L. Brown	bl.light
		T7S, R5W, Sec. 1SW			
7	Jackson	3 mi E Ocean Springs	22 May 1983	P.K. Lago	
1	Jackson	6 mi SSE Ocean Springs	9 May 1988	P.K. Lago	
	Jackson	Horn Island		(Richmond, 1962)	
9	Jackson	Ocean Springs	12-14 Aug 1977	S.E. Hurdle	
1	Jackson	Ocean Springs	23 May 1983	P.K. Lago	
1	Jackson	Ocean Springs	30 Jun 1984	P.K. Lago	
1	Jackson	T5S,R8W, Sec. 5	20 May 1978	S.C. Elliot	
2	Jackson	T5S,R8W, Sec. 5	3 Sep 1982	P.K. Lago	
7	Jasper	6 mi NW Montrose	7 May 1980	P.K. Lago	
2	Jones	Sandersville	11 Aug 1986	S. Testa III	
3	Kemper	2 mi N Scooba,	8 Aug 1991	T.L. Schiefer	bl.light
		T12N, R18E, Sec. 29, 30			
1	Lafayette	4 mi W Abbeville	1 Jul 1986	S. Testa III	
1	Lafayette	Oxford	2 May 1983	P.K. Lago	
1	Lafayette	Oxford	11 May 1980	P.K. Lago	
1	Lafayette	Oxford	19 May 1982	P.K. Lago	
1	Lafayette	Oxford	26 May 1982	P.K. Lago	
2	Lafayette	Oxford	29-30 May 1977	P.K. Lago	
2	Lafayette	Oxford	4 Jun 1982	P.K. Lago	
5	Lafayette	Oxford	7-10 Jun 1978	P.K. Lago,	
				M.O. Mann	
1	Lafayette	Oxford	14 Jun 1982	P.K. Lago	
2	Lafayette	Oxford	13 Jul 1982	P.K. Lago	
4	Lafayette	Oxford	28 Jul 1979	P.K. Lago	
2	Lafayette	Oxford	25 Aug 1981	P.K. Lago	
2	Lafayette	Oxford	28 Aug 1979	P.K. Lago	
1	Lafayette	5 mi E Oxford	18 Jun 1977	D.F. Stanford	
1	Lafayette	5 mi E Oxford	6 Jul 1977	D.F. Stanford	
7	Lafayette	5 mi NW Oxford	14 Apr 1987	S. Testa III	
1	Lafayette	7 mi NW Oxford	12 Apr 1991	P.K. Lago	
2	Lafayette	7 mi W Oxford	29 May 1982	P.K. Lago	
1	Lafayette	8 mi NE Oxford	17 Sep 1987	S. Rosado	
21	Lafayette	T7S,R4W, Sec. 24	3 May 1979	P.K. Lago,	
				M.O. Mann	
9	Lamar	3.5 mi WNW Purvis	20 Jun 1987	P.K. Lago	
5	Lamar	5 mi N Baxterville	23 May 1980	P.K. Lago	
6	Lamar	5 mi N Baxterville	19 Apr 1979	P.K. Lago	
26	Lamar	4.5 mi N Baxterville,	27 Jul 1986	P.K. Lago	
		Half Moon Ck.			
1	Lamar	5 mi N Baxterville	9 Apr 1981	P.K. Lago	
10	Lamar	Lumberton	27 Jun 1987	P.K. Lago	
2	Lauderdale	3 mi S Arundel	11 Aug 1986	P.K. Lago	
1	Leflore	1.5 mi NW Itta Bena	26 Jun 1987	S. Testa III	
1	Leflore	6 mi WSW Itta Bena	26 Jun 1987	S. Testa III	
2	Lincoln	3.5 mi SW Brookhaven	26 Apr 1987	S. Testa III	
6	Lowndes	T17N, R16E, Sec. 34	3 Jun 1991	D.M. Pollock	bl.light
6	Lowndes	T17N, R16E, Sec. 34	19 Jun 1991	D.M. Pollock	bl.light
1	Lowndes	T17N, R16E, Sec. 34	1 Oct 1991	D.M. Pollock	bl.light
1	Lowndes	T17N, R16E, Sec. 5	11 May 1991	D.M. Pollock	bl.light
5	Madison	7.5 mi SE Canton	19 Jun 1987	S. Testa III	
1	Madison	8 mi SE Canton	6 May 1980	P.K. Lago	
1	Marion	4 mi E Sandy Hook	26 Apr 1987	S. Testa III	
3	Marion	Lake Columbia	21 Apr 1979	P.K. Lago	
5	Marion	Lake Columbia	27 Jun 1986	S. Testa III	
1	Marshall	Holly Springs	2 Jun 1977	S.E. Hurdle	
5	Marshall	Holly Springs	15 Jul 1977	S.E. Hurdle	
1	Marshall	Wall Doxey St. Pk.	30 May 1986	S. Testa III	
9	Marshall	Wall Doxey St. Pk.	30 Jul 1986	S. Testa III	
2	Marshall	Wall Doxey St. Pk.	9 Sep 1980	P.K. Lago	
1	Monroe	ca. 5 mi NE Hamilton	26 Apr 1991	D. Pollock	bl.light
14	Neshoba	1.5 mi N Dixon	9 May 1979	P.K. Lago	
1	Newton	6 mi SE Newton	10 May 1979	P.K. Lago	
4	Noxubee	10 mi W Macon	11 Aug 1987	S. Testa III	
1	Oktibbeha	T19N, R15E, Sec. 16	30 May 1991	D.M. Pollock	bl.light
1	Oktibbeha	T19N, R15E, Sec. 16	31 Oct 1991	D.M. Pollock	bl.light
1	Pearl River	1 mi SW Silver Run	26 May 1980	P.K. Lago	
1	Pearl River	6 mi SW Silver Run	12 May 1986	S. Testa III	
5	Perry	13.5 mi S New Augusta	22 May 1987	P.K. Lago	
1	Pike	3 mi N Summit	26 Apr 1987	P.K. Lago	
2	Pike	3 mi S Magnolia	10 Jun 1977	B.P. Stark	
1	Pike	5.5 mi WSW McComb	25 Jun 1987	P.K. Lago	
1	Pontotoc	3 mi ESE Toccopola	27 Jun 1981	P.K. Lago	
1	Scott	3.5 mi SW Forest	28 Feb 1988	P.K. Lago	
4	Scott	Golden Mem. St. Pk.	28 Feb 1988	P.K. Lago	
9	Sharkey	2.5 mi E Anguilla	26 Jun 1987	S. Testa III	
18	Sharkey	Rolling Fork	26 Jun 1987	S. Testa III	
2	Simpson	3 mi WNW D'Lo	1 Jul 1986	P.K. Lago	
2	Simpson	4 mi SE Pinola	2 Jun 1986	B.P.Stark	
7	Simpson	4.5 mi NW Magee	1 Jul 1986	P.K. Lago	
1	Simpson	Tanyard Ck. X Hwy 28	24 May 1980	B.P. Stark	
1	Smith	Mize	28 Feb 1988	P.K. Lago	
1	Stone	Univ. Miss. Forrestlands	9 Apr 1992	P.K. Lago	
1	Stone	13 mi SE Wiggins	26 Jun 1986	S. Testa III	
1	Stone	13 mi SE Wiggins	8 May 1986	P.K. Lago	
1	Stone	Red Ck. X Hwy 15	24 May 1980	P.K. Lago	
1	Stone	Univ. Miss. Forestlands	27 Feb 1988	P.K. Lago	
1	Stone	Univ. Miss. Forestlands	15 Apr 1977	A.E. Zuccarro	
1	Stone	Univ. Miss. Forestlands	7 May 1987	P.K. Lago	
1	Stone	Univ. Miss. Forestlands	14 May 1986	S. Testa III	
3	Stone	Univ. Miss. Forestlands	18-20 May 1978	P.K. Lago,	
				S.C. Elliott	
5	Stone	Univ. Miss. Forestlands	24 May 1980	P.K. Lago	
1	Stone	Univ. Miss. Forestlands	25 Jun 1986	P.K. Lago	
19	Sunflower	5 mi SE Indianola	26 Jun 1987	S. Testa III	
2	Tallahatchie	Webb	16 Aug 1988	S. Testa III	
1	Tishomingo	Tishomingo St. Pk.	9 Jun 1984	P.K. Lago	

No.	County	Site	Date	Collector	Other Data
1	Tishomingo	Tishomingo St. Pk.	17 Jun 1986	S. Testa III	
1	Tishomingo	Tishomingo St. Pk.	22 Jul 1978	S.E. Hurdle	
1	Tunica	5.5 mi W. Robinsonville	15 Jul 1978	D.F. Stanford	
3	Union	12.5 mi W New Albany	28 Jul 1986	P.K. Lago	
1	Union	2 mi N Etta	12 May 1992	P.K. Lago	bl.light
14	Walthall	6 mi Ne Tylertown	26 Apr 1987	S. Testa III	
1	Walthall	Tylertown	26 Apr 1987	P.K. Lago	
8	Washington	Greenville	early Jul 1982	G. Snodgrass	
1	Washington	Greenville	30 Sep 1982	G. Snodgrass	bl.light
13	Washington	Stoneville	12 Jul 1989	J.R. MacDonald	
1	Wayne	State Line	20 May 1983	P.K. Lago	
2	Wayne	Waynesboro	19 May 1983	P.K. Lago	
4	Webster	2 mi SE Cumberland, T20N, R12E, Sec. 17	12 Jun 1990	T.L. Schiefer	bl.light
2	Webster	Walthall	11 Aug 1987	S. Testa III	
3	Yazoo	1 mi W Bentonia	19 Jun 1987	S. Testa III	

Appendix 45. *Enochrus perplexus.*

2	Amite	Mt. Nebo Lake	25 Jun 1987	S. Testa III	
1	Bolivar	2 mi W Rosedale	20 Jun 1980	P.K. Lago	
2	George	12 mi SW Lucedale	19 May 1987	P.K. Lago	
1	George	3 mi SSW Benndale	24 May 1980	P.K. Lago	
1	Grenada	T21N,R2E, Sec. 12,13N R3E, Sec.7S,18N	5-11 Jun 1991	T.L. Schiefer	mv & bl.light
1	Hancock	Kiln	26 May 1980	P.K. Lago	
1	Hancock	Point Clear Island	15 Aug 1986	S. Testa III	bl.light
1	Hancock	Stennis Space Center	25 Jun 1991	P.K. Lago	
1	Harrison	4.5 mi NNW Gulfport	26 Feb 1988	P.K. Lago	
1	Humphreys	4 mi SW Belzoni	26 Jun 1987	S. Testa III	
5	Jackson	3 mi E Ocean Springs	22 May 1963	P.K. Lago	
	Jackson	Horn Island		(Richmond, 1962)	
1	Lafayette	Oxford	12 Jun 1978	P.K. Lago	
1	Lafayette	Oxford	25 Jun 1978	P.K. Lago	
2	Lamar	4 mi NNE Baxterville	27 Jun 1986	S. Testa III	
1	Lowndes	14 mi W Columbus	20 May 1992	P.K. Lago	bl.light
8	Lowndes	T17N, R16E, Sec. 34	3 Jun 1991	D.M. Pollock	bl.light
2	Lowndes	T17N, R16E, Sec. 34	19 Jun 1991	D.M. Pollock	bl.light
2	Oktibbeha	Adaton	3 Jun 1981	W.H. Cross	
1	Oktibbeha	Starkville	10-11 May 1982	W.H. Cross	
2	Oktibbeha	Starkville	24 Jun 1975	W.H. Cross	
1	Oktibbeha	T19N, R14E, Sec. 16	16 May 1991	D.M. Pollock	bl.light
1	Oktibbeha	T19N, R15E, Sec. 16	30 May 1991	D.M. Pollock	bl.light
1	Stone	13 mi SE Wiggins	26 Jun 1986	S. Testa III	
1	Stone	Univ. Miss. Forestlands	20 May 1978	P.K. Lago	
1	Tishomingo	Tishomingo St. Pk.	6 Jun 1992	P.K. Lago	bl.light
1	Washington	Greenville	early Jul 1982	G. Snodgrass	bl.light
2	Washington	Stoneville	12 Jul 1989	J.R. MacDonald	bl.light
2	Webster	2 mi SW Cumberland, T20N, R12E, Sec. 17	12 Jun 1990	T.L. Schiefer	bl.light

Appendix 46. *Enochrus pygmaeus nebulosus.*

1	Adams	Natchez	17 May 1983	A.E. Zuccaro Jr.	
2	Attala	10 mi SW Sallis	1 Jul 1986	S. Testa III	
3	Bolivar	2 mi W Rosedale	20 Jun 1980	P.K. Lago	
1	Bolivar	2 mi W Rosedale	10 Oct 1980	P.K. Lago	
1	Claiborne	Sand Ck. @ waterfall	3 Jun 1986	B.P.Stark	
8	De Soto	8 mi WSW Hernando	1 Aug 1987	S. Testa III	
1	Forrest	2.5 mi NW Fruitland Park	21 May 1987	S. Testa III	
3	Forrest	P. B. Johnson St. Pk.	30 Apr 1981	P.K. Lago	
1	George	7 mi S Benndale	11 Apr 1981	P.K. Lago	
1	George	12 mi SW Lucedale	19 May 1987	P.K. Lago	
2	George	12 mi SW Lucedale	19 May 1987	S. Testa III	
		Rines Lake			
1	Grenada	T21N,R2E, Sec. 12,13N & R3E, Sec. .7S,18N	21-28 May 1991	T.L. Schiefer	bl.light on sandbar
1	Grenada	T21N,R2E, Sec.12,13N & & R3E, Sec. 7S,18N	29 May-4 Jun 1991	R.L. Brown	bl.light
14	Grenada	T21N,R2E, Sec. 12,13N & & R3E, Sec. 7S,18N	28 Aug-3 Sep 1991	T.L. Schiefer	bl.light
7	Hancock	Point Clear Island	12 Aug 1986	S. Testa III	
9	Hancock	Point Clear Island	12-15 Aug 1986	S. Testa III	bl.light
1	Hancock	Point Clear Island	23 Oct 1986	S. Testa III	artesian pond
1	Harrison	12.5 mi E Saucier	25 May 1987	S. Testa III	
1	Harrison	Saucier	27 Feb 1988	P.K. Lago	
1	Issaquena	Valley Park	26 Jun 1987	S. Testa III	
2	Jackson	Blackmon's Fork River	16 Jun 1986	B. P. Stark	
2	Jackson	11 mi NW Van Cleave	25 May 1987	S. Testa III	
	Jackson	Horn Island		(Richmond, 1962)	
4	Jackson	Ocean Springs	12-13 Aug 1977	S.E. Hurdle	
1	Jasper	4 mi S Heidelberg	14 Jun 1987	S. Testa III	
2	Jones	Sandersville	11 Aug 1986	S. Testa III	
1	Kemper	3 mi N Scooba, T12N, R18E, Sec. 19SE	3 Oct 1991	T.L. Schiefer	bl.light
2	Lafayette	Oxford	4 May 1977	P.K. Lago	
1	Lafayette	Oxford	8 May 1978	P.K. Lago	
1	Lafayette	Oxford	16 May 1978	P.K. Lago	
3	Lafayette	Oxford	19 May 1977	P.K. Lago	
2	Lafayette	Oxford	21 May 1979	P.K. Lago	
2	Lafayette	Oxford	7-12 Jun 1978	P.K. Lago	
3	Lafayette	Oxford	14 Jun 1979	P.K. Lago	
1	Lafayette	Oxford	25 Sep 1981	P.K. Lago	
1	Lafayette	Oxford	3 Oct 1976	R. Y. Joe	
3	Lafayette	5 mi E Oxford	10 Jun 1977	D.F. Stanford	
1	Lafayette	5 mi E Oxford	18 Jun 1977	D.F. Stanford	
1	Lafayette	5 mi E Oxford	27 Jul 1977	D.F. Stanford	
1	Lafayette	5 mi NW Oxford	31 May 1978	P.K. Lago	
1	Lafayette	6 mi E Oxford	30 Apr 1980	S.C. Elliott	
1	Lafayette	7 mi E Oxford	18 Jul 1984	P.K. Lago	
2	Lafayette	7 mi W Oxford	29 May 1982	P.K. Lago	
1	Lafayette	11 mi NW Oxford	25 Jul 1978	S.E. Hurdle	
1	Lafayette	T7S,R2W, Sec. 34	20 Jun 1978	D.F. Stanford	
1	Lafayette	U of M Campus	17 Jul 1978		
1	Lamar	3.5 mi WNW Purvis	25 Jun 1987	P.K. Lago	
16	Lowndes	2.5 mi W Columbus	11 Aug 1987	S. Testa III	
10	Lowndes	T17N, R16E, Sec. 34	3 Jun 1991	D.M. Pollock	bl.light
7	Lowndes	T17N, R16E, Sec. 34	19 Jun 1991	D.M. Pollock	bl.light
1	Marion	Lake Columbia	27 Jun 1986	S. Testa III	
1	Marshall	Holly Springs	2 Jun 1977	S.E. Hurdle	
1	Marshall	Wall Doxey St. Pk.	30 Jun 1986	M.C. Beiser	
2	Marshall	Wall Doxey St. Pk.	15 Jun 1986	P.K. Lago	
13	Marshall	Wall Doxey St. Pk.	30 Jul 1986	S. Testa III, M.C. Beiser	
1	Newton	6 mi SE Newton	10 May 1979	P.K. Lago	
1	Newton	4 mi E Newton	10 May 1979	P.K. Lago	
1	Oktibbeha	T19N, R15E, Sec. 16	16 May 1991	D.M. Pollock	bl.light
1	Sharkey	Rolling Fork	26 Jun 1987	S. Testa III	
1	Simpson	Tanyard Ck. X Hwy 24	1 May 1980	B.P. Stark	
1	Stone	T3S,R9W, Sec. 17	10 May 1986	S. Testa III	
1	Stone	Univ. Miss. Forestlands	18 May 1978	P.K. Lago	
1	Tishomingo	Tishomingo St. Pk.	17 Jun 1986	S. Testa III	
1	Union	10 mi W New Albany	18 Jul 1986	P.K. Lago	
1	Union	7.5 mi S New Albany	29 Jul 1988	S. Testa III	sandy stream
1	Washington	Greenville	30 Sep 1982	G. Snodgrass	bl.light

Appendix 47. *Enochrus pygmaeus pygmaeus.*

	Greene		(Gundersen, 1978)
	Jackson		(Gundersen, 1978)

Appendix 48. *Enochrus reflexipennis.*

1	Adams	Natchez	15 May 1977	A.E. Zuccarro Jr.	
4	Hancock	Point Clear Island	14 Feb 1987	S. Testa III	artesian pond
1	Hancock	Point Clear Island	28 Feb 1987	S. Testa III	artesian pond
2	Hancock	Point Clear Island	28 Feb 1987	S. Testa III	brackish pond
1	Hancock	Point Clear Island	9 May 1986	S. Testa III	bl.light
2	Hancock	Point Clear Island	23 Jun 1987	S. Testa III	artesian pond
1	Hancock	Point Clear Island	23 Jun 1987	S. Testa III	brackish pond
2	Hancock	Point Clear Island	23 Jun 1987	S. Testa III	bl.light on beach
109	Hancock	Point Clear Island	12-15 Aug 1986	S. Testa III	
163	Hancock	Point Clear Island	12-15 Aug 1986	S. Testa III	bl.light
36	Hancock	1 mi SSW Lakeshore	23 Jun 1987	S. Testa III	bl.light
67	Hancock	1 mi SSW Lakeshore	12 Aug 1986	S. Testa III	bl.light
33	Hancock	1.5 mi SW Lakeshore	12 Aug 1986	S. Testa III	bl.light
1	Harrison	5 mi NW De Lisle	26 Feb 1988	S. Testa III	
1	Harrison	W Ship Island	14 Mar 1992	T.L. Schiefer	on beach
1	Jackson	Ocean Springs	13 Aug 1977	S.E. Hurdle	
1	Stone	13 mi SE Wiggins	26 Jun 1986	P.K. Lago	

Appendix 49. *Enochrus sayi.*

1	Adams	Natchez	25 Jun 1987	A.E. Zuccaro Jr.	
4	Adams	Natchez St. Pk.	23 Jun 1982	P.K. Lago	
2	Amite	Mt. Nebo Lake	25 Jun 1987	S. Testa III	
1	Adams	Natchez St. Pk.	17 Apr 1985	P.K. Lago	
2	Bolivar	2 mi W Rosedale	20 Jun 1980	P.K. Lago	
1	De Soto	8 mi WSW Hernando	1 Aug 1987	S. Testa III	
1	George	7 mi S Benndale	11 Apr 1981	P.K. Lago	
1	Grenada	T21N,R2E, Sec.12,13N & R3E, Sec.7S,18N	5-11 Jun 1991	T.L. Schiefer	mv & bl.light
1	Hancock	Point Clear Island	14 Feb 1987	S. Testa III	artesian pond
2	Hancock	Point Clear Island	9 May 1986	S. Testa III	bl.light
2	Hancock	Point Clear Island	23 Jun 1987	S. Testa III	bl.light
1	Hancock	Point Clear Island	23 Jun 1987	S. Testa III	bl.light on beach
3	Hancock	Point Clear Island	15 Aug 1986	S. Testa III	bl.light
1	Harrison	12.5 mi E Saucier	25 May 1987	S. Testa III	
1	Harrison	5 mi NW De Lisle	26 Feb 1988	S. Testa III	
1	Lafayette	4.5 mi SW Abbeville	27 Jul 1986	S. Testa III	
5	Lamar	3.5 mi WNW Purvis	20 Jul 1987	P.K. Lago	
1	Lee	Tombigbee St. Pk.	24 Jun 1979	A. Johnson	
5	Lowndes	T17N, R16E, Sec. 34	3 Jun 1991	D.M. Pollock	bl.light
2	Lowndes	T17N, R16E, Sec. 34	1 Oct. 1991	D.M. Pollock	bl.light
4	Lowndes	2.5 mi W Columbus	11 Aug 1987	S. Testa III	
1	Madison	8 mi SE Canton	6 May 1990	P.K. Lago	
11	Marshall	Wall Doxey St. Pk.	15 Jul 1986	M.C. Beiser	
10	Marshall	Wall Doxey St. Pk.	30 Jul 1986	S. Testa III	
1	Stone	Univ. Miss. Forestlands	10 Apr 1981	P.K. Lago	
1	Stone	Univ. Miss. Forestlands	24 May 1980	P.K. Lago	
1	Tishomingo	Tishomingo St. Pk.	17 Jun 1986	S. Testa III	
1	Union	12.5 mi W New Albany	28 Jul 1986	P.K. Lago	
1	Washington	Greenville	early July 1982	G. Snodgrass	bl.light
1	Washington	Stoneville	12 Jul 1989	J.R. MacDonald	bl.light
1	Yalobusha	5 mi SW Coffeeville	17 Jul 1986	P.K. Lago	

Appendix 50. *Enochrus sublongus.*

1	Amite	Mt. Nebo Lake	25 Jun 1987	S. Testa III	
1	Claiborne	Sand Ck. @ waterfall	3 Jun 1986	B.P. Stark	
1	Forrest	P. B. Johnson St. Pk.	30 Apr 1981	P.K. Lago	
1	George	12 mi SW Lucedale	10 Apr 1992	P.K. Lago	
1	George	3 mi SSW Benndale	24 May 1980	P.K. Lago	
1	Hancock	Point Clear Island	14 Feb 1987	P.K. Lago	artesian pond
6	Hancock	Point Clear Island	9 May 1986	P.K. Lago	bl.light
2	Hancock	Point Clear Island	23 Jun 1987	S. Testa III, P.K. Lago	artesian pond
1	Hancock	Point Clear Island	23 Jun 1987	P.K. Lago	
20	Hancock	Point Clear Island	15 Aug 1986	P.K. Lago	bl.light
19	Hancock	Point Clear Island	15 Aug 1986	P.K. Lago	
1	Hancock	4.5 mi NNW Lyman	27 Feb 1988	S. Testa III	
5	Hancock	5 mi NW De Lisle	26 Feb 1988	S. Testa III	
1	Hancock	6 mi WNW Waveland	14 May 1984	P.K. Lago	
1	Hancock	6 mi WNW Waveland	26 May 1980	P.K. Lago	
3	Hancock	T8S,R12W, Sec .24	27 Feb 1988	S. Testa III	
1	Harrison	3.5 mi NE Saucier	13 May 1984	P.K. Lago	
1	Harrison	W Ship Island	27 Mar 1988	T.L. Schiefer	beach drift on N side island
1	Jackson	1 mi W Hwy. 90 & 57, T7S, R8W, Sec. 25	5 Mar 1991	D.M. Pollock	bl.light

No. County	Site	Date	Collector	Other Data
1 Jackson	3 mi E Ocean Springs	22 May 1983	P.K. Lago	
3 Stone	11 mi ESE Perkinston	24 May 1987	P.K. Lago	
9 Stone	Univ. Miss. Forestlands	9 Apr 1992	P.K. Lago	
1 Stone	2 mi N Perkinston	25 May 1987	P.K. Lago	
1 Stone	Univ. Miss. Forestlands	24 May 1980	P.K. Lago	
1 Walthall	6 mi NE Tylertown	26 Apr 1987	S. Testa III	
1 Washington	Stoneville	12 Jul 1989	J.R. MacDonald	bl.light

Appendix 51. *Helochares maculicollis.*

8 Adams	14 mi E Sibley, Pipe Lake	18 May 1981	P.K. Lago	
2 Calhoun	Calhoun City	11 Aug 1987	S. Testa III	
6 Claiborne	1.5 mi SW Port Gibson	26 Jun 1987	S. Testa III	
2 Greene	3 mi E Sand Hill	27 Jun 1984	P.K. Lago	lake margin.
3 Grenada	Grenada Lake Dam Area	12 Jul 1986	S. Testa III	
1 Hancock	6 mi WNW Waveland	26 May 1980	P.K. Lago	
4 Holmes	Holmes Co. St. Pk.	1 Jul 1986	P.K. Lago	
1 Humphreys	4 mi SW Belzoni	26 Jun 1987	S. Testa III	
2 Jackson	Ocean Springs	12 Aug 1977	S.E. Hurdle	
2 Jackson	3 mi E Ocean Springs	22 May 1983	P.K. Lago	
5 Jasper	6 mi NW Montrose	7 May 1980	P.K. Lago	
1 Lafayette	Oxford	7 Aug 1978	P.K. Lago	
31 Lafayette	5 mi E Oxford	18 Jun 1977	D.F. Stanford	
10 Lafayette	T7S,R2W, Sec. .25	25 Jul 1978	S.E. Hurdle	
1 Lafayette	T7S,R2W, Sec. .25	27 Sep 1978	L.G. Lang	
1 Lamar	5 mi N Baxterville	19 Apr 1979	P.K. Lago	
1 Madison	7.5 mi SE Canton	19 Jun 1987	S. Testa III	
2 Marion	Lake Columbia	27 Jun 1986	S. Testa III	
1 Marion	Lake Columbia	9 Apr 1979	P.K. Lago	
5 Neshoba	1.5 mi N Dixon	9 May 1979	P.K. Lago	
4 Newton	6 mi SE Newton	10 May 1979	P.K. Lago	
3 Scott	Golden Mem. St. Pk	28 Feb 1988	P.K. Lago	
1 Scott	Roosevelt St. Pk.	10 Aug 1988	P.K. Lago	
1 Simpson	4 mi SE Pinola	13 May 1985	B.P. Stark	
1 Yazoo	1 mi W Bentonia	19 Jun 1987	S. Testa III	

Appendix 52. *Helobata striata.*

Jackson	Horn Island		Richmond, 1962)

Appendix 53. *Helocombus bifidus.*

16 Adams	Natchez	27-30 May 1977	A.E. Zuccaro Jr.	
1 Forrest	P. B. Johnson St. Pk.	23 Jun 1986	P.K. Lago	
1 Grenada	T21N,R2E, Sec.12,13N & & R3E, Sec.7S,18N	5-11 Jun 1991	T.L. Schiefer	mv & bl.light
11 Grenada	T21N, R3E, Sec. 7SW	18 Jun 1990	T.L. Schiefer	bl.light
1 Lafayette	Oxford	5 Jul 1978	D.F. Stanford	
1 Lafayette	5 mi NW Oxford	12 Jun 1984	D.F. Stanford	
7 Leake	nr. Tupelo	28 May 1986	F.N. Young	woods pond
3 Lowndes	T17N, R16E, Sec. 34	3 Jul 1991	D.M. Pollock	bl.light
3 Lowndes	14 mi W Columbus	20 May 1992	P.K. Lago	bl.light
2 Marshall	Holly Springs	11 Jun 1977	S.E. Hurdle	
1 Marshall	T3S,R3W, Sec.13	10 Jun 1977	S.E. Hurdle	
1 Noxubee	Noxubee Natl. W. Refuge	27 May 1989	T.L. Schiefer	mv & bl.light
1 Oktibbeha	Adaton	4 Jun 1981	W.H. Cross	
2 Oktibbeha	Adaton	22 Jun 1973	C. Bryson	
2 Oktibbeha	Dorman Lake	23 Jun 1983	R.L. Brown	bl.light
1 Oktibbeha	Noxubee Natl. W. Refuge	17 Jul 1981	G.L. Snodgrass	
1 Oktibbeha	Starkville	26 May 1982	W.H. Cross	
1 Oktibbeha	Starkville	5 Jun 1982	W.H. Cross	
1 Oktibbeha	Starkville	20 Jun 1982	R.L. Brown	
1 Pontotoc	1 mi SE Ecru	17 Jul 1980	W.H. Cross	
1 Pontotoc	1 mi SE Ecru	20 Aug 1980	W.H. Cross	
2 Pontotoc	28 May 1986	F.N. Young	woods pond	
18 Tallahatchie	3.5 mi S Charleston	7 Jun 1992	P.K. Lago	bl.light
1 Tishomingo	Tishomingo St. Pk.	9 Jun 1984	P.K. Lago	

No. County	Site	Date	Collector	Other Data

Appendix 54. *Cymbiodyta chamberlaini.*

1 Adams	14 mi E Sibley, Pipe Lake	18 May 1983	P.K. Lago	
2 Amite	Mt. Nebo Lake	25 Jun 1987	S. Testa III	
1 Attala	8.5 mi SW Sallis	1 Jul 1986	P.K. Lago	
5 Calhoun	T11S,R3W, Sec. 14	12 Jul 1978	D.F. Stanford	
1 Choctaw	Choctaw Lake	18 May 1990	P.K. Lago	
1 Clarke	Clarkco St. Pk.	22 May 1985		
4 Clarke	Clarkco St. Pk.	9 Jun 1969	P.S. Bartholomew	
2 George	6 mi W Pascagoula R.	17 Jun 1960	F.N. Young	pool
8 Hancock	Stennis Space Center	25 Jun 1991	P.K. Lago	
1 Harrison	3.5 NE Saucier	19 Apr 1985	P.K. Lago	
4 Harrison	3.5 NE Saucier	13-14 May 1984	P.K. Lago	
1 Jackson	Gulf Is. Natl. Seashore	19 Apr 1985	R.L. Brown	
6 Jackson	Gulf Is. Natl. Seashore	3 Jun 1984	R. Brown et al.	
1 Jackson	11 mi NW Van Cleave	11 May 1986	P.K. Lago	
1 Jackson	6 mi SSE Ocean Springs	9 May 1986	P.K. Lago	
1 Jackson	Ocean Springs	3 May 1947	H. Dietrich	
3 Jackson	Ocean Springs	24 Jun 1931	L.D. Beamer	
1 Jackson	I-10 at Escatawpa River, T7S,R5W, Sec. 1SW	21 Apr 1990	R.L. Brown	bl.light
1 Lafayette	T7S,R2W, Sec. 24	21 Apr 1978	D. F. Stanford	
4 Lafayette	T7S,R4W, Sec. 24	8 Mar 1979	M.O. Mann	
1 Lafayette	3 mi SE Oxford	28 Apr 1985	G. Dick	
1 Lafayette	6 mi E Oxford	21 Mar 1977	T. McCraine	
2 Lafayette	6 mi ENE Oxford	15 Jul 1988	P.K. Lago, S. Testa III	
1 Lamar	Lumberton	23 May 1980	Paul K. Lago	
1 Lamar	1.5 mi n Baxterville	2 Mar 1979	P.K. Lago	
2 Lamar	3.5 mi NNE Baxterville	27 Jun 1986	S. Testa III	
1 Marshall	Wall Doxey St. Pk.	20 Dec 1979	M.O. Mann	leaf litter.
1 Neshoba	7.5 mi E Philadelphia	27 May 1989	P.K. Lago	
1 Noxubee	Noxubee Natl. W. Refuge, T16N, R15E, Sec. 3SW	18-20 Oct. 1990	J.R. MacDonald	pitfall
1 Oktibbeha	Noxubee Natl. W. Refuge	21 Jul 1981	G.L. Snodgrass	
1 Oktibbeha	Noxubee Natl. W. Refuge	28 Jul 1981	R.L. Brown	
3 Pearl River	1 mi SW Silver Run	12 May 1986	P.K. Lago	
5 Stone	11.5 mi WSW Perkinston	28 May 1988	S. Testa III	in small pond, ex. *Eleocharis*
8 Stone	13 mi SE Wiggins	8-13 May 1986	P.K. Lago	
1 Stone	Red Ck. X Hwy 15	9 May 1986	S. Testa III	
1 Stone	Red Ck. X Hwy 15	18 May 1987	P.K. Lago	
3 Stone	Univ. Miss. Forestlands	11-14 May 1986	S. Testa III	
1 Wayne	Waynesboro	26 Jun 1931	H. Dietrich	

Appendix 55. *Cymbiodyta semistriata.*

2 Claiborne	Owen CK Natchez Trace	7 Apr 1987	B.P. Stark

Appendix 56. *Cymbiodyta vindicata.*

1 Amite	Mt. Nebo Lake	25 Jun 1987	S. Testa III	
1 Calhoun	T11S,R3W, Sec. .22	20 Feb 1981	M.O. Mann	
1 Claiborne	Sand Ck. @ waterfall	3 Jun 1986	B.P. Stark	
1 Forrest	2.5 mi NW Fruitland Pk.	21 Apr 1991	R.L. Brown	bl.light
1 Jackson	I-10 at Escatawpa River T7S, R5W, Sec. 1SW	21 Apr 1991	R.L. Brown	bl.light
1 Lafayette	T7S,R4W, Sec. .24	26 Jan 1979	M.O. Mann	
2 Leake	nr. Tupelo	28 May 1986	F.N. Young	woods pond
2 Lowndes	14 mi W Columbus	20 May 1992	P.K. Lago	bl.light
1 Oktibbeha	Noxubee Natl. W. Refuge	17 Jul 1981	G.L. Snodgrass	
1 Pearl River	1 mi SW Silver Run	12 May 1986	P.K. Lago	
2 Stone	2 mi N Perkinston	25 May 1987	S. Testa III	
1 Tippah	2.5 mi WSW Walnut	10 Mar 1993	P.K. Lago	small rivulet in woods